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Investigating an Intervention Used to Address Underachievement in Gifted and Non-Gifted High School Students: A Mixed Methodological Study

Melissa (Missy) C. Sullivan
Old Dominion University

INVESTIGATING AN INTERVENTION USED TO ADDRESS UNDERACHIEVEMENT IN GIFTED AND NON-GIFTED HIGH SCHOOL STUDENTS: A MIXED METHODOLOGICAL STUDY

by

Melissa (Missy) C. Sullivan
M.Ed. May 2003, University of Connecticut
M.Ed. May 1995, Bowie State University
B.S. May 1990, Towson State University

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Approved by:

_____
Dr. Peter Baker (Director)

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Dr. Charlene Fleener
(Member)

_____
Dr. Shana Pribesh (Member)

_____
Dr. Del Siegle (Member)

ABSTRACT

INVESTIGATING AN INTERVENTION USED TO ADDRESS UNDERACHIEVEMETN IN GIFTED AND NON-GIFTED HIGH SCHOOL STUDENTS: A MIXED METHODOLOGICAL STUDY

Missy C. Sullivan
Old Dominion University, 2016
Director: Dr. Peter Baker

Recent concerns in the field of gifted education focus on students who are not performing at their ability level. These students can be classified as underachieving gifted students. In their research, Rubenstein, Siegle, Reis, McCoach, and Burton (2012) found that though gifted students are not typically considered at risk, there is a growing group of gifted students who are not motivated to learn, which is frustrating for parents, teachers, and counselors. Highly capable students are not being engaged in their classes which causes underachievement in these students (Kim, 2008). The purpose of this mixed methodological study will be to investigate if a goal-setting intervention impacts academic performance and attitudes in gifted achievers and underachievers as well as non-gifted achievers and underachievers. How students value a goal setting intervention as it relates to a higher level mathematics course will also be addressed.

Data were collected through reported grades, intervention meetings, interviews, and student questionnaires and analyzed using descriptive statics, analysis of variance (ANOVA), analysis of covariance (ANCOVA), and content analysis of interview transcripts. Findings from the study confirm that there is a higher Academic Self-Perception Academic Self-Perception in underachieving gifted students who received the

intervention. Results from the exit questionnaire show that though students did not improve academically, they still found value in a goal-setting intervention.

This thesis is dedicated to my mom Jayne who encouraged me to always strive for more academically. She also taught me to preserve and be tenacious in whatever challenge is set before me leading by her example. I would not be the woman I am today without her support, understanding, and unequivocal love.

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CHAPTER I: INTRODUCTION

One of the biggest disappointments to a school culture is an intelligent child who cannot or will not achieve at the expected level causing a possible behavioral problem or even social anxiety for that child (Gowan, 1955). The mismatch between intelligence and performance is known as underachievement. Underachievement, which is defined as students not performing to their anticipated achievement, can happen from Kindergarten to college, in either female or male students, and in any cultural group (Karaduman, 2013). Teachers, administrators, and parents alike are perplexed by the fact that some gifted students fail many of their academic subjects. Even when they are placed in the seemingly appropriate classes, some highly capable students are often not engaged, which causes underachievement in these students (Kim, 2008). Other gifted children may feel the pressure to accomplish above average standards. These individuals can suffer from perfectionism, performance anxiety, the apprehension to fail, and being a social outcast (Morisano & Shore, 2010). Educators need to find strategies that will help underachieving gifted students.

Problem Statement

The problem of underachieving students has been a challenge to researchers (Baum, Renzulli, & Hebert, 1995). Finding reasons why students are not achieving could possibly help students as they approach graduation from school in order to pursue a college degree, a career in the military, or a job in the current work force. A solution should be investigated to help support students who are bright but not succeeding. In the current high school setting, underachieving gifted students are expected to achieve at a higher level based on their ability. However, many underachieving gifted students are

not motivated in the same way as their non-gifted peers (Baslanti & McCoach, 2006; Kanevsky & Keighley, 2003; McCoach & Siegle, 2003). These gifted students require a different approach. Educators could use a proven intervention in order to help underachieving gifted students do better in school. The work of McCoach and Siegle (2005) has resulted in a theoretical framework that will be discussed in the following section. This framework is the cornerstone of the intervention on which this study was based.

Theoretical Framework

The study was rooted in the theoretical work of Bandura's (1977, 1986) self-efficacy theory, Weiner's (1986) attribution theory, Eccles and Wigfield's (1995) expectancy-value theory, and Lewin's (1951) person-environment fit theory. The combined research of these theories led to the development of the theoretical framework: Achievement Orientation Model (AOM; Figure 1).

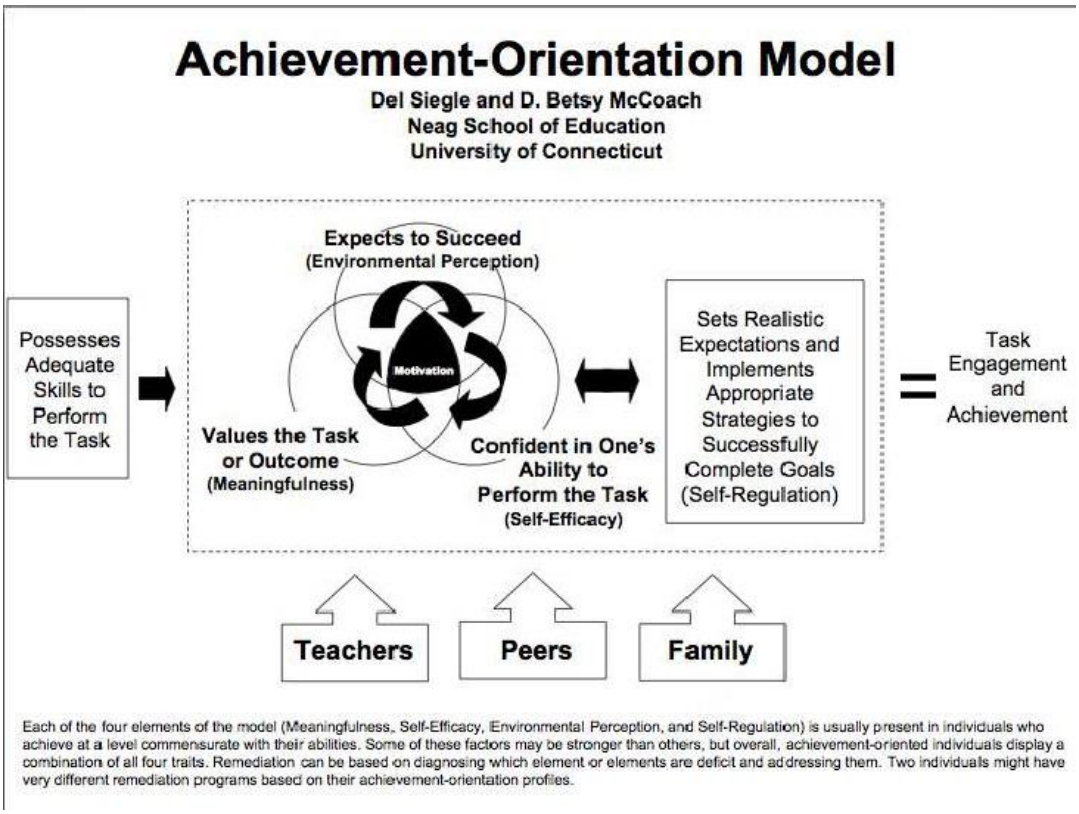

Figure 1. Achievement Orientation Model (Siegle & McCoach, 2005)

The AOM model (2005) suggests that in order for students to achieve, they first need to have some ability to complete the task at hand. Once that is established, three expectancies need to exist. The student must find value or make meaning of the task; the students should also realize that they can be successful when asked to do the task; and finally the students must know that the effort they put forth will allow them to complete the task. When these three ideals are present and self-regulation happens then subsequently the child should be engaged and achieve academically. Siegle and McCoach (2005) point out that, though these ideals should be in place they need not be equally strong; however, each needs to be positive. For example, students may find great value in a task. This circle may be a bit larger than the self-efficacy or environmental circle. However, if the student has positive self-efficacy and environmental perceptions then

idealist is fine if one other circle, task valuation for instance, is larger than the others. If any of the three components is not positive for the child, then no matter how strong the other two components are, motivation and achievement are affected adversely.

Bandura (1977) defined self-efficacy as an individual's belief in their ability to plan, manage, and execute a required task. If students do not believe they can do a certain task, then there is a lack of motivation. Further, Zientak and Thompson (2010) identified a positive correlation between students' self-efficacy and academic success. Other examination led to the idea that students who display high self-efficacy are apt to try difficult tasks and will continue to persist when the tasks prove to be difficult (Bandura, 1986; Lyman, Prentice-Dunn, Wilson, & Bonfilio, 1984; Schunk, 1981). Students will be successful with a growth mindset (Dweck & Molden, 2005). Dweck (2006) outlines two types of mindsets: growth mindset and fixed mindset. In the fixed mindset, the idea of intelligence is never changing. A person with this thinking feels that they are either smart or not. In a growth mindset, the idea of intelligence is more fluid; a person can learn to do anything with enough work and practice. Gifted students need to be able to make the connection that the effort they put in a task has an impact on their academic success (Rubenstein, Siegle, Reis, McCoach, & Greene-Burton, 2012).

Though students may understand that the effort they put forth will lead to academic success, students also need to find the task to be meaningful. Expectancy-Value Theory (Eccles & Wigfield, 1995) suggests that students are successful if they have two orientations: (1) they expect to succeed; and (2) they find the task of value to them. In order to find value in a task, the student has to find importance in attaining the goal (Battle, 1966; Rotter, 1982). Educators should realize that with their background

knowledge students can learn quickly, and learning needs to keep up with the students' intellect. If students are not intellectually challenged, they may feel the assignment is not worth the time it would take to complete it (Archambault, Westberg, Brown, Hallmark, Emmons, & Zhang, 1993; Renzulli & Reis, 1997; Siegle & McCoach, 1999; VanTassel-Baska & Stambaugh, 2005). Traditional learning environments often do not allow for learning to happen in a way where assignments are differentiated according to difficulty in this fashion (Fredricks, Alfed, & Eccles, 2010).

A supportive environment is necessary in order to foster students' growth. Lewin (1951) created a heuristic formula that supports the premise that if students interact with the environment favorably then they will find success which will allow them to grow. Students are successful when they perceive that there is support at home and at school. Types of home support may include: (1) a parent asking their child how the day went; (2) reviewing grades; or (3) assisting with homework. Students also need to have strong relationships with peers, teachers, and parents in their environment in order to achieve to their potential. If students perceive that any of these areas is lacking, no matter what the truth actually may be, then the students may underachieve (Greene, 2001). The students may know they have the ability to succeed with an assigned task, and they may also know the value of that task; however, if the student does not feel supported in the environment they may not attempt to complete the task (Rubenstein et al., 2012). We can expect students to succeed when they know a task can be accomplished, that task is meaningful, and there is a supportive environment for them (Siegle & McCoach, 2005).

The last component needed for success is the ability for a student to self-regulate. When students learn how to develop self-regulatory skills they tend to succeed (Ruban &

Reis, 2006). However if any one of the other components to the theoretical framework is missing—self-efficacy, task meaningfulness, or environmental perception—then students may not have the desire to learn self-regulatory skills (Rubenstein, Siegle, Reis, McCoach, & Greene-Burton, 2012).

Purpose Statement

The purpose of this research was to compare students who have received a goal valuation intervention to students who have not in terms of academic attitude and academic performance. Within both the major comparison groups, the following subgroups exist: underachieving gifted high school students, achieving gifted high school students, underachieving non-gifted high school students and achieving non-gifted high school students (See Table 1). All students, who fit into one of the eight subgroups, are enrolled in a higher level mathematics (See Table 1).

Table 1

Comparison Groups for Intervention

Group	Control	Experimental (Intervention)
Non-achieving gifted	0	X
Achieving gifted	0	X
Non-achieving non-gifted	0	X
Achieving non-gifted	0	X

Comparisons were also made between the eight groups, as seen above, and their overall academic performances as well as their academic attitude.

The final purpose was to determine if a goal setting intervention is considered worthwhile by underachieving gifted students, achieving gifted students, underachieving non-gifted students, and achieving non-identified students in a higher level mathematics course.

Study Design

The study followed a mixed methods design with a qualitative case study element. Measurements were conducted in order to compare all the control group and its subgroups to the experimental group and its subgroups in terms of overall academic attitudes as measured by the School Attitude Assessment Survey–Revised (SAAS-R; McCoach & Siegle, 2003) and academic performance. Academic performance was measured by using grades derived from the participating students in the math analysis course at three different intervals; 1st Interval (at 4 weeks into the course), 2nd Interval (at 8 weeks into the course), and 3rd Interval at (12 weeks into the course) (Figure 1). Follow-up questionnaires and a review of grades after the intervention helped the teachers determine if the intervention improved math achievement in gifted and non-gifted students. These steps followed the Pretest-Posttest Control Group Design.

Qualitative data collection occurred during one-on-one interviews to determine if a goal setting intervention was worthwhile in an advanced mathematics course. Only students in the experimental group were interviewed. Further data was added from the worksheets the students completed during the intervention (See Appendix Z). The intervention was administered to the experimental groups over an eight-week period.

Research Questions and Hypotheses

The research questions that were addressed in the study, along with their corresponding hypotheses, are included below. Some researchers would likely posit null hypotheses for each of this study's quantitative research questions (i.e., hypotheses predicting no differences between the control and experimental groups) on the grounds that interventions among high school-aged students do not prove effective because they come too late (Whitmore, 1986; Anderson, & Keith, 1997; Diaz, 1998). In this case, though, the researcher asserted directional, alternative hypotheses for each of the quantitative research questions. Because of the philosophical underpinnings of qualitative inquiry, no hypothesis was asserted for the qualitative research question (i.e., question five, below) which was explored in this study. The main research questions that were answered by this study, along with their corresponding hypotheses, are as follows:

1. How do underachieving gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of overall academic attitudes?
    a. Hypothesis: underachieving gifted high school students who participate in the personal goal-setting intervention will demonstrate more positive overall academic attitudes than will their non-participating peers.
2. How do underachieving gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of actual academic performance?

   a. Hypothesis: underachieving gifted high school students who participate in the personal goal-setting intervention will demonstrate more academic performance than will their non-participating peers.

3. How do underachieving high school students not identified as gifted who participate in a personal goal-setting intervention compare to their non-participating peers in terms of overall academic attitudes?
   a. Hypothesis: underachieving non-gifted high school students who participate in the personal goal-setting intervention will demonstrate more positive overall academic attitudes than will their non-participating peers.
4. How do underachieving high school students not identified as gifted who participate in a personal goal-setting intervention compare to their non-participating peers in terms of actual academic performance?
   a. Hypothesis: underachieving non-gifted high school students who participate in the personal goal-setting intervention will demonstrate more academic performance than will their non-participating peers.
5. In what ways do participating students value a goal setting intervention as it relates to a higher level mathematics course?

Definitions of Key Terms

Much nomenclature was used throughout this study as we discuss the intervention that will be used with high school students. Important words to this study are defined below

Performing - students who are completing all tasks required in the course and receiving grades that are either an A or B

Goal valuation - goals that can be set and acquired which correspond to the subjectivity of being valued by the student

Self-efficacy - an individual's belief in their ability to plan, manage, and execute a required task

Intrinsic motivation - the motivation that naturally comes from within and has students wanting to achieve in a particular subject or with a particular topic due to the interest they show

Extrinsic motivation - motivation that is spurred by external influences (i.e., rewards)

Mentoring - students working with individuals who they look up to in some way

Sufficient academic performance - Students receiving a B or better in the class while also completing all assigned tasks of the class

Underachievement – For the purpose of this study, students who are receiving a letter grade of C, D or E in math analysis

Gifted underachiever – For the purpose of this study, students who are identified as gifted but receive a C, D or E in math analysis

Non-gifted underachiever – For the purpose of this study, students who are not identified as gifted learners but are receiving a C, D or E in math analysis

Self-perception - students' belief about themselves and their ability to succeed in an academic setting

Attitude - the feeling one has towards a person, a task, a parent, etc.

Gifted – The following definition is taken from the large school system where the study is to take place:

> Children who have been identified as gifted and talented (GT) have the potential to achieve high levels of accomplishment that need to be recognized and addressed. These students exhibit unusual performance capability in intellectual endeavors in one or more academic areas: mathematics, science, social studies, and/or language arts as assessed through multiple sources of information to include nationally norm referenced tests, a Gifted Behaviors Rating Scale, student work samples, and other evidence that supports a need for advanced academic services. In order to meet their needs and develop their abilities, these advanced learners require a differentiated curriculum that is engaging, complex, and differentiated in the depth, breadth, and pace of instruction through a broad range of opportunities that enrich and extend the program of studies in all subject areas (Local Plan for Gifted Education, 2015, p. 6).

Academic attitudes - students' self-perception, motivation/self-regulation, goal valuation, attitudes toward teachers, and attitudes towards school.

1st Interval or Baseline academic performance – academic grades used to determine achievement and underachievement leading up to first progress report.

2nd Interval or Mid-point academic performance – academic grades used to determine progress leading up to the first quarter report card.

3rd Interval or Post-intervention academic performance – academic grades used to determine progress during the 2nd grading period up to the 2nd quarter progress report.

Total intervention academic performance - academic grades used to determine progress from the 1st quarter progress report to the 2nd quarter progress report.

Overview of Methods

The study followed a mixed methods design with a true experimental elements and a qualitative case study element. . In order to accomplish random assignment of gifted students to treatment conditions, it was most appropriate for a random number generator to be used. Random assignment to groups was used by creating an alphabetized list of gifted student participants, assigning each of these students a unique, sequential number and, using a random number generator to select participants, each of whom was alternatingly assigned to either the control or treatment group. This component of the grouping process can be understood as non-proportional quota-based random assignment. The school's electronic scheduling program assigned the non-gifted student participants to one of the two groups. Because the numbers of gifted students in each of the groups was close to equivalent, so too was the number of non-gifted participants within each group. While the school's scheduling program is "random" in that it assigns students to classes without consideration of these students' or teachers' personal or academic characteristics, the program does so with respect to each student's unique daily schedule. As such, this component of the grouping process should be seen as convenience sampling. In order to ensure that this component of the grouping process did not adversely impact the study's comparisons, rigorous baseline comparisons were

performed—both in terms of student attitudes and performance. These analyses provided the researcher with sound data used to demonstrate approximate group equivalence.

Both groups of participants received the regular math analysis curriculum with the same teacher. As is the participating teacher's standard practice, if students in either group struggled with content, they received help from the teacher before or after school as well as during their study block. Both groups were also given the same assignments and assessments to measure their knowledge in math analysis.

The experimental group received goal-setting strategies from the math analysis teacher during their class. They also met with the gifted resource teacher for 10-15 minutes a week to complete different goal-setting exercises. It was the intent of the researcher to determine whether the intervention impacted students' achievement and attitudes in the high level mathematics class.

Those students, who also had an additional study block within the school day, participated in the qualitative portion of the study. The decision to use only the students who are enrolled in a study block was to limit the time they are taken from regular instruction. The school system where the study took place prefers empirical studies to interfere with as little instructional time as possible. Students involved in the qualitative component of the study met with the gifted resource teacher once a week for 10-15 minutes during their study block. These students received qualitative questions that resulted in data used to answer the fifth research question listed above. Twenty-one students were involved in this component of the study.

As discussed previously, quantitative measurements were taken in order to compare the control groups and the experimental groups in terms of their overall

academic attitudes as measured by the School Attitude Assessment Survey–Revised (SAAS-R), (McCoach & Siegle, 2003). Academic performance was measured by using grades derived from the participating students during the 1st, 2nd, and 3rd Intervals of the study. In lieu of traditional interviews, qualitative data collection was conducted during one-on-one goal settings sessions to determine if a goal setting intervention was worthwhile in an advanced mathematics course. As discussed previously, the intervention was administered to the experimental groups over an eight-week period. Follow-up surveys and a review of grades after the intervention helped the teachers draw conclusions from the study. These steps follow the Pretest-Posttest Control Group Design.

Delimitations

Students chosen for this study were only located in one school and enrolled in a math analysis class. Collected data from the school district showed that greatest decline in academic performance is in math analysis. Since this is a system-wide problem only math analysis was investigated in this study. There was one mathematics teacher and one gifted resource teacher involved in administering the intervention. Students involved with the study were enrolled in two of the five classes taught by the math analysis teacher. The intervention lasted nine weeks and occurred from the months of October to December.

Organization of the study

The remainder of this document is organized into four additional chapters. Chapter 2 involves a review of the literature defining the gifted population, the complexities of underachievement, the characteristics of achievers and underachievers, the characteristics of producers and non-producers, the causes of underachievement, the

problems faced by underachievers, research involving math instruction and researched interventions used to help reverse underachievement. Chapter 3 describes the research design and methodology of the study. The population, data type, collection methods, and procedures are discussed in the third chapter, as well. Chapter 4 will contain the result of the study's analyses. Chapter 5 will include interpretations and explanations of the study findings, conclusions that were drawn, and recommendations.

CHAPTER II: LITERATURE REVIEW

Definition of Giftedness

When starting to examine giftedness and who exactly is gifted, it is important to review the definition of giftedness. Prevalent among educators is an ongoing debate on determining the best definition for and the identification of gifted learners (Carman, 2013; Nevo, 1994; Sternberg, 1990). Researchers have been seeking that optimal concept since the launch of Sputnik (Davis, Rimm, & Siegle, 2010). It is important to find a definition of giftedness in order to identify gifted learners properly. Ackerman (1997) states, "One of the most critical problems in gifted identification stems from confusion in the field about what giftedness is and how it should be defined" (p. 229). Although differing views of a gifted definition provides good debate, without a solid identification procedure for gifted students can prove frustrating to current researchers (Carman, 2013). When determining giftedness there exist several sources, with different findings. The National Association of Gifted Children's (NAGC) definition states that:

> Gifted individuals are those who demonstrate outstanding levels of aptitude (defined as an exceptional ability to reason and learn) or competence (documented performance or achievement in top 10% or rarer) in one or more domains. Domains include any structured area of activity with its own symbol system (e.g., mathematics, music, language) and/or set of sensorimotor skills (e.g., painting, dance, sports) (NAGC, 2013, para. 5).

Since the study took place in a large school system in Virginia it was important to understand the state's definition. The State of Virginia's definition of gifted is as follows:

Gifted students means those students in public elementary, middle, and secondary schools beginning with kindergarten through twelfth grade who demonstrate high levels of accomplishment or who show the potential for higher levels of accomplishment when compared to others of the same age, experience, or environment. Their aptitudes and potential for accomplishment are so outstanding that they require special programs to meet their educational needs. These students will be identified by professionally qualified persons through the use of multiple criteria as having potential or demonstrated aptitudes in one or more of the following areas: 1) General intellectual aptitude. Such students demonstrate or have the potential to demonstrate superior reasoning; persistent intellectual curiosity; advanced use of language; exceptional problem solving; rapid acquisition and mastery of facts, concepts, and principles; and creative and imaginative expression across a broad range of intellectual disciplines beyond their age-level peers, 2) Specific academic aptitude. Such students demonstrate or have the potential to demonstrate superior reasoning; persistent intellectual curiosity; advanced use of language; exceptional problem solving; rapid acquisition and mastery of facts, concepts, and principles; and creative and imaginative expression beyond their age-level peers in selected academic areas that include English, history and social science, mathematics, or science, 3) Career and technical aptitude. Such students demonstrate or have the potential to demonstrate superior reasoning; persistent technical curiosity; advanced use of technical

> language; exceptional problem solving; rapid acquisition and mastery of facts, concepts, and principles; and creative and imaginative expression beyond their age-level peers in career and technical fields, 4) Visual or performing arts aptitude. Such students demonstrate or have the potential to demonstrate superior creative reasoning and imaginative expression; persistent artistic curiosity; and advanced acquisition and mastery of techniques, perspectives, concepts, and principles beyond their age-level peers in visual or performing arts (Virginia Administrative Code Title 8 § 20-40-20).

Theorists, such as Reis and McCoach (2000) expressed that due to the variance of state to state testing, these measures might not capture a student's school experience, and their grades can be unreliable and subjective. Since no test is fully reliable in evaluating a student's achievement (e.g., a student being sick on the day of the testing or a fire alarm going off in the middle of the exam), it would be difficult to determine giftedness with one score (Hoover-Schultz, 2005).

According to the local district's plan, where the study took place, a gifted student may have the potential to achieve high levels of accomplishment however some students do not achieve at the level that is expected (Local Plan for Gifted Education, 2015, p. 6). Though the overall term of giftedness is defined in several different ways by varying agencies, some theorists define giftedness into several categories.

When determining giftedness theorists will look at the terminology in two different ways: (1) entity theorists believe that giftedness is fixed and cannot be changed while, (2) incremental theorists believe that intelligence can be improved with effort (Snyder et al.,

2013). Each of these theories examines predictability of how a student will perform in any type of advanced programming (Yeager & Dweck, 2012). Incremental theorists will attribute success to effort and goal-setting, whereas entity theorists surmise that academic success and failure is due to a person's ability (Dweck & Leggett, 1988; Yeager & Dweck, 2012). Regardless of the giftedness definition a program employs, the potential for underachievement exits in all gifted programs.

Underachievement defined. The development of how underachievement is defined has a long history. In the early 1980s, Joanne Whitmore, in her work with elementary students, defined gifted underachievement as having an IQ score of at least 130 on the *Stanford Binet* or the *Wechsler Intelligence Scale for Children,* but exhibiting behaviors such as poor test performance, achievement at or below grade-level teacher expectations, daily work not being completed, extraordinary comprehension in a subject when interested, huge gap between the quality of oral and written work, a talent for creative production, avoidance of work where perfection may not be obtained, perseverance in subjects of interest, low self-esteem, awkwardness in social situations, and resistance toward teacher attempts for motivation (Whitmore, 1980). Throughout the decade, other theorists weighed in on the definition of underachievement either building on changing the ideas of Whtimore.

Tannenbaum (1983) added his definition of underachievement. He characterized an underachieving student as one, who for a year, has not achieved to his or her ability, based on the observation of the teacher. Missing from this definition is what particular observation or measure the teacher takes to judge the student's performance, or their lack

of performance. As years passed, changes to the definition of gifted underachievement occurred until theorists began to categorize. it started to become categorized.

McCall et.al (1992) described that the lack of a consistent definition for underachievement was problematic. In their study the researchers found that most of these underachievement definitions are based on standardized test score cutoffs and the grades they receive in school (McCall et al., 1992). It is easier to use standardized test scores related to grades because the scores are easily used when defining eligibility for special programming for underachievement (McCall et al., 1992).

In later research, Clark (1997) categorized underachievers into two groups: "situational underachievers" and "chronic underachievers." Situational underachievers only underachieve on occasion, usually when something is going on in the home or when the student does not get along with the teacher. Conversely, the chronic underachiever is consistent in his or her poor performance at school. These students tend to be resistant to any type of remediation (Clark, 1997). As the field approached the 21st century, other researchers added to the definition of gifted underachievement.

Based on their research, Reis and McCoach (2000) concluded that many gifted educators agree on three "types" of underachievers; the anxious underachiever, the rebellious underachiever, and the complacent/coasting underachiever. Reis and McCoach further identified underachieving students as:

> Students who exhibit a severe discrepancy between expected achievement (as measured by standardized achievement test scores or cognitive or intellectual ability assessments) and actual achievement (as measured by class grades and teacher evaluations). To be classified as an underachiever, the discrepancy between

> expected and actual achievement must not be the direct result of a diagnosed learning disability (Reis & McCoach, 2000, p. 157).

Through their categorization of the three types, Reis and McCoach developed their working definition of gifted underachievement: the discrepancy between expected and actual achievement (Reis & McCoach, 2000). They also pointed out that learning disabilities are important to determine when identifying those who exhibit underachievement. Based on their recommendation, educators should make sure to have some measure for identifying a learning disability. Other researchers continued to design their definitions of gifted underachievement.

Delisle and Galbraith (2002) theorized that the term *underachievement* was too vague to apply to all of the students who fell into this category. They explained that underachievers can be categorized as those who are *conventional* and those who are *selective*. The student who is the conventional underachiever has low self-esteem and is doubtful when it comes to his or her own intelligence. The selective underachiever does well on tests but chooses not to do work that is not challenging. Delisle and Gallbraith (2002) further assert that educators of the gifted need to alter their methods when working with these students in order to be successful in helping them achieve (Delisle & Galbraith, 2002). In support of this idea, four other studies (Hebert & Schreiber, 2010; Kanevsky & Keighley, 2003; Speirs-Neumeister & Hebert, 2003; Thompson & McDonald, 2007) confirm Delisle and Galbraith's (2002) idea that the selective consumer is different from the conventional underachiever. Other theorists have found a difference in gifted underachievement.

Figg, Rogers, McCormick, and Low (2012) conducted extensive literature reviews about gifted underachievers and classified them as "achieving, underachieving, and selective consumers" (p. 54). It should be understood that an achieving gifted learner is one who is doing what is expected, receiving good grades, participating in class, and meeting the expectations that most educators have about the gifted student. According to Fig et al. (2012):

> The conventional underachiever, is insecure about his ability to do well, cautious about pursuing new topics, and self-deprecating and self-critical about his academic ability. Whereas the selective consumer knows he is smart, knows he is capable of obtaining straight-As, and enjoys learning, yet participates only in work that is of interest because he knows school is not the only place where learning occurs. (p. 55)

Though there tends to be disagreement on the actual definition of underachievement there is also just as much when defining the underachieving student.

Defining the underachieving gifted student. Educators with underachieving gifted students in their classes need to identify and plan for the kinds of students they will encounter. Delisle and Galbraith (2002) argued that "by altering our approaches to working with these (gifted) children, we will have a better chance of achieving success with [managing underachievement]" (p. 188). However, there is an ongoing debate on the definition of gifted underachievement. The debate has led theorists to classify different types of underachievers.

Dowdall and Colangelo (1982) stated that underachievers can be classified as those students who have the potential and are predicted to achieve but are not achieving

to their assumed potential. Rimm (2003) would find fault with this theme since it is discussed in her article that genuine underachievement varies in degree. When combining the varying definitions of underachievement with those of giftedness, it becomes difficult to come to a consensus of what a "true" definition of underachieving giftedness is for all students. Particular school districts or even individual schools must be relied upon to determine the definition of gifted underachievement (Ford & Thomas, 1997).

Theorists such as Diane Heacox (1992) categorize underachievers as one or more of the following; a rebel, a conformist, a stressed learner, a victim, a distracted learner, a bored student, a complacent learner, and a single-sided achiever. Learners such as the rebel believe there is no connection between the outside world and school. The rebels actively work against class rules, as they tend to fight with adults. and won't do any work to rebel against the rules of the class. The conformists feel pressure from peers and want to blend in, whereas stressed learners are perfectionists and nothing is done to their liking. Struggling learners may have gotten through elementary school but as they move on to high school they struggle with their learning. Victims do not accept responsibility and find others to blame and distracted learners have too much going on in the outside world to concentrate on doing well in school. Bored learners do not do anything in class since the work is not challenging, the complacent learners is content with how they are doing and have no plan on improving, and single-sided achievers only do well in the subject they enjoy (Heacox, 1992). Other theorist also found differences in types of underachievement. Table 2 compares Heacox's (1992) underachievers to Mandel and Marcus' (1996) and Rimm's (2003) underachievers.

Table 2

Aligning Theorists' Types of Underachievers

	Heacox (1992)	**Mandel & Marcus (1996)**	**Rimm (2003)**
Underachievers not attempting to complete work	Complacent learner	Coasting underachiever	Passive Paul
Underachievers who feel pressure	Stressed learner	Anxious learner	Perfectionist Pearl
Underachievers who refuse to do work	Rebel	Defiant underachiever	Rebellious Rebecca
Underachiever who are emotional		Sad and depressed underachiever	Depressed Donna
Underachiever who seems enthusiastic but will argue about work		Identity search underachiever	Creative Chris
Underachiever who doesn't believe in his/her abilities and will		Wheeler dealer underachiever	Manipulative Maria

make deals to get out of it			
Underachiever who participates socially but won't achieve because of image	Conformist	Dominant conformer	Social Sally
Underachiever who blames everyone but themselves	Victim		Poor Polly
Underachiever who is easily distracted from the task to be accomplished	Distracted Learner		Torn Tom

Those students who don't attempt to complete work in class would be considered by Heacox (1992) as *complacent*; by Mandel and Marcus (1996) as the *coasting underachiever* and by Rimm (2003) as *Passive Paul.* Underachieving students who put pressure on themselves and cannot or will not complete work would be considered by Heacox (1992) as *the stressed learner*; by Mandel and Marcus (1996) as the *anxious underachiever* and by Rimm (2003) as *Perfectionist Pearl.*.

What Underachievement Looks Like

With many definitions of underachievement it is important to address what characteristics a gifted underachiever should have when identifying them for programming (McCall et al., 1992). Once these students are identified, successful programming becomes a possibility.

The gifted underachiever. Current research has explained why students, who are extremely bright, do not achieve in school (Abu-Hamour & Al-Hmouz, 2013; Balduf, 2009; and Chukwu-Etu, 2009). For example, Renzulli & Park (2000, 2002) found that over a third of all high school dropouts with above average intellect left school due to failing grades. The research of Landis & Reschly (2013) conveys another aspect of this problem: when underachieving gifted students are not engaged, they are more likely to drop out.

Affective needs of gifted students needs consideration, when searching for reasons for a student's lack of success. When students do not have social-emotional security, they tend to underachieve in school (Blaas, 2014). It was also concluded in this study that there is a correlation between underachievement and low social-emotional beliefs. Educators need to find supportive ways to meet the affective needs of highly intelligent students. Due to the fact that research has shown a correlation between social-emotional difficulties and underachievement in gifted students, more attention is now given to developing positive social-emotional skill in gifted students (Blaas, 2014).

Not only should affective needs be met, but the level of responsibility that the student takes in his learning should be evaluated. Cramond, Kuss, and Nordin, (2007) conducted a qualitative study of high-ability students who admitted they did not put forth

the effort needed in order to graduate from high school. These students signed up for courses that did not provide challenge; and they consequently dropped out of high school. Landis and Reschly (2013) concluded that when underachieving gifted students are not engaged, they are more likely to drop out. Providing positive school environments and encouraging effort and engagement are methods of keeping students challenged and possibly stopping students from withdrawing from school altogether. Educators need to work with the intellectually identified student, as well as the parents, in order to provide what is needed for success.

Clemmons (2005) found a strong correlation between positive attitudes toward school and parental involvement. Parents or influential adults can be strong motivators to help students succeed. Parental involvement influences students' positive self-perception with regard to their academic success (Clemmons, 2005). Schools can provide programs for the intellectually gifted students that can help connect them with mentors as well as provide challenge in an effort to help them graduate.

In a longitudinal study conducted by Merrotsy (2008), the Armindale Catholic Schools Office in New South Wales, Australia, ran a community project. Students who were identified for the gifted program received extra programing at school as well as the opportunities to attend gifted camps. Results of the study showed that even though students who had participated in the gifted program did not show significant gains in state testing, their gains were significant when compared to the state average. Student attendance also improved from 70% attending school to 97% attending when participating in the program. Students had a positive attitude about learning and enjoyed being friends with other students who had a similar intellectual make-up as they did

(Merrotsy, 2008). Gifted programming should be purposeful and provide students with the tools to help them be successful. It is important to identify what research has shown to help students with academic performance.

Needs for intervention programs that address gifted underachievement have been identified, including enrichment, acceleration, and creative/critical thinking strategies (Seedorf, 2014). Helping students become aware of how they can reach success, has proven to be beneficial to the learner. Ariyaratne (2008) conducted a study involving 450 primary grade students from Sri Lanka. An experimental group was formed from students who did not score above the 85th percentile on the Raven's Standard Progressive Matrices non-verbal assessment. These students received a metacognitive intervention program using Feuerstein, Rand and Hoffman's (1979) Learning Potential Assessment Device, which facilitated self-efficacy through scaffolding. An ANOVA test revealed an increase in scores for the experimental group in both the post-test and the far post-test. In the post test, 34% of the experimental group performed above the 85th percentile. In the far post-test, most of the students managed to maintain this score. This particular study shows why it is important for students to focus on their self-efficacy. Therefore, the role self-efficacy plays in helping to reverse underachievement is important for educators to understand.

Cannon, Harding, Merrotsy, and Ryan (2008) completed a two year study in which they evaluated academic underachievement in students who were enrolled at a low socio-economic independent school located in New South Wales, Australia. An intervention to help with reversing underachievement was put into place and supplemented with help from students, parents and teachers. Themes in the qualitative data showed that in order to

reverse underachievement, self-efficacy should be addressed. Other themes that emerged were consideration for a student's zone of proximal development, high but realistic teacher expectations, good relationships between the teacher and students, strategies to increase engagement and effort, and meeting with the student to discuss academic growth. Quantitative data showed a significant improvement in effort for 20% of the participants as well as a 30% improvement in academic performance. Interventional programs that are designed for above average learners help with increasing academic success. A strong gifted program will include a variety of instructional practices as well as differentiation for content, process, and product through readiness, interest and learning style (Tomlinson, 1999).

The non-gifted underachiever. Underachievement can be a problem for any type of learner. It should be of particular interest to research because underachievement can follow students, gifted and non-gifted, throughout their educational career (Balduf, 2009). Examining reasons for underachievement in those who are considered average and below average learners is important to the overall understanding of underachievement (Aud, Hussar, Planty, Snyder, Bianco, Fox, Frohlich, Kep, & Drake, 2010; Chukwu-Etu, 2009; and Seymour & Hewitt, 1997). If we can understand problems of underachievement in other learners, new insights may help with the gifted population.

Aud et al., (2010) examined racial differences in achievement. They found on average African American youth scored 26 points lower on standardized reading and mathematics tests when compared to Caucasian youth. In 2009, 16% of African American fourth graders performed at the proficient level in reading and mathematics when compared to the 42% Caucasian fourth graders who scored at the same level. By

their eighth grade year, 14% of African Americans scored at the proficient level in reading and mathematics when compared to the 41% Caucasian eighth graders who scored at the same level (Aud et al., 2010). This gives rise to the concern that programs should be in place that are unique to cultural difference. Culture and gender are vital when looking at any student who is underachieving (Chukwu-Etu, 2009). Some research has already compared cultural differences as well as how the home influences the non-gifted underachiever. Smith (2005) found that underachievement in an urban school may be influenced by regional or sub-cultural differences; however, factors that occur in the school or home have a greater influence on a student's achievement. Understanding the particular triggers that promote underachievement in non-gifted learners must also be examined.

The importance of Grade Point Average (GPA) is another factor to consider as it has been found to define a student's self-worth. A drop in GPA can be devastating and might cause students to drop out of challenging programs (Seymour & Hewitt, 1997). When students realize that they are underachieving, it can result in devastating consequences. In a meta-analysis study, Chukwu-Etu (2009) found that some students in the United States, who have been labeled as underachievers, drop out even though they may only be underachieving in one subject. It was also concluded that several factors cause underachievement in students: (1) lack of motivation, (2) influence from parents or home, (3) lack of nurturing intellectual potential, (4) value conflict, (5) health issues, (6) learning disabilities, and (7) having teachers who lack knowledge or understanding interventions for underachievement (Chukwu-Etu, 2009).

Another area to examine with underachieving students is the behavioral aspect. Fite, Hendrickson, Rubens, Gabrielli, and Evans (2013) conducted a study with 147 students, ranging from five to thirteen years old. These students were from low income families and participated in an afterschool program where the study took place. Researchers were interested to see if there was a relationship between reactive aggression and academic performance as well as the role peer rejection played in the scenario. Findings indicated that there was a positive correlation between students with high levels of reactive aggression and low academic success. It was also found that peer rejection accounted for the relationship between reactive aggression and academic performance (Fite et al., 2013). Underachievement in non-gifted students is not only a problem in the K-12 setting but can also find its way into the college atmosphere as well.

In a quantitative study conducted by Honken (2013), 279 first-time, full-time engineering students from a medium-sized, urban, engineering school were surveyed about their behaviors during their first year of college. The students had performed extraordinarily in high school with 37% of those in the study having a high school GPA of 4.0 or higher. A positive correlation was found between a lack of self-control (i.e., poor study habits, lack of time management, incompletion of homework, etc.) and a low GPA during their first semester of college.

The above has given a snapshot of the difference between gifted and non-gifted learners. Though each of these learners may have different profiles it could be helpful to look at the characteristics and attitudes of the overall underachiever.

Characteristics of underachievers. Although differences in characteristics of underachievers exist, a list of what to look for in these types of learners can be compiled

when examining the research. Gallagher (1991) suggests characteristics of underachievers include low levels of self-confidence, the inability to persevere, a lack of goals, and having feelings of inferiority. In addition to this research, Davis and Rimm (1998) point out that if students do not know how to study well, are having problems being accepted by peers, causing discipline problems, and complaining in class about a lack of connection between the effort put toward school work and its outcome, then they might be underachieving students.

Emotional factors need to be determined when identifying underachievement. Dyrda (2009) identified emotional characteristics on this issue, including immaturity on both a social and emotional level, and either being withdrawn from social situations or rebellious in classroom situations. Dyrda (2009) also indicated that the "nonconformist" underachiever is one who has a strong sense of self-worth, is extremely confident in his or her own abilities, and tries to display self-confidence and decisiveness even though the work produced is not up to the standards it should be when compared to others. When exploring the "nonconformists" further, it is interesting to note that their giftedness might be overlooked due to their underachievement.

Batdal-Karaduman (2013) identified students who are underachieving to be those not making the effort that is expected of them in school. They do not meet what the school is asking of them; however, outside of school these same students are very different. It is stated that

> Many individuals who are not academically successful have outside interest where their talents and abilities shine. There are plenty of so-called "poor students" who blossom when the final bell rings. They are

> computer whiz kids, accomplished musicians and dancers, active volunteers in their church or community organizations. Just because they don't perform well in school doesn't mean they can't perform at all – a fact that's important to remember and keep remembering. (p. 166)

There seems to be difficulty in determining if the students are struggling with achievement or if they are choosing not to achieve due to circumstance. It is also important to understand the attitude the student has toward learning. Knowing the beliefs students have when entering the educational setting may help the underachievement problem.

Attitudes of gifted underachievers. One of the strongest indicators of underachievement is attitudes that these learners have towards their schoolwork, teachers, and peers (Assouline, Colangelo, Ihrig, & Forstadt, 2006; Baslanti & McCoach, 2006; and Schommer, 1994). For example, attitudinal differences have been found to exist between female and male students. Assouline et al. (2006) completed a study to determine what gifted learners attribute academic failure to in the areas of language arts, science, and math. Students were asked to compare ability, long-term effort, task-difficulty, favoritism expressed toward them by their instructor, situational effort or sheer luck when identifying their underachievement. The results of the study showed that gifted students realized not working hard attributed to underachievement. It was also found that boys felt they were not smart enough when it came to their underachievement, but girls felt lack of effort contributed to theirs. Knowing these beliefs can help provide appropriate modifications to programs. This study consisted of 4,901 gifted learners in 3rd through 11th grade. The researchers also found that as students move to high school, they

realize that the curriculum becomes more challenging, and this attributes to their success or failure (Assouline et al., 2006). The results of this study show that student belief is strong in underachievement and should be considered when finding the best intervention. However, finding an intervention that will help students with their belief system may be a challenge.

Schommer (1994) found that "It appears that even the gifted are not immune to beliefs that may have disabling effects, particularly in the first two years of high school" (p. 207). The research also found evidence that these beliefs could make or break a student's thinking, especially in the first two years of high school (Schommer, 1994). This is important to remember for the timing of an intervention's implementation. It is imperative to work on the students' beliefs about their learning before they leave high school as it may follow them after they graduate.

Underachievement characteristics bridge to the collegiate level. In their study, Baslanti and McCoach (2006) found students also underachieve in college. These students had low academic self-perception and poor attitudes toward teachers and school, as well as little goal valuation, motivation, and self-regulation. In order to reverse beliefs about these particular areas, educators should intervene early enough in order to reverse a learner's belief about his or her thinking. This thinking is specific to the "emotional" underachiever. The underachiever who is classified as a "non-producer" has a different issue in learning.

Kavevsky and Keighley (2003) found that although non-producers were frustrated with their learning situation, the attitudes were surprisingly positive: "Their (non-producers') intrinsic motivation to learn burned bright. They were articulate and

optimistic. None used a complaining tone or whined, but some were clearly frustrated, angry, and demoralized" (p. 26).

Based on the research, it seems as if underachievement for a student who is dealing with it from an emotional aspect does not have much control over the best way to approach successful achievement in school, whereas the non-producing student has a choice with regard to his or her achievement (Figg et.al, 2012). Both types of underachievers are frustrated by their situations, and the consequences to both can be devastating. Ramifications to both types of learning can include, but are not limited to poor grades, no support of talents, loss of potentials being reached, lack of college success, and less than expected occupational achievements (McCall, Evahn, & Dratzer, 1992; Kanevsky & Keighley, 2003; & Siegle, 2013). The field of educational research should continue to examine the consequences and ramifications of underachievement. Research has been completed in the field that discusses what is needed in order to address these issues.

Underachievement Clarified

Many practitioners continue to debate about who is and who is not underachieving, based on the definition (Baum, Renzulli, & Hebert, 1995). There is disagreement about the general term for gifted underachievement although most definitions describe it as the potential for academic behavior but the lack of producing what is expected (Emerick, 1992; Reis & McCoach, 2000; Siegle, 2013). It is difficult for educators to agree what an underachiever is for this reason. One teacher may identify a student who is earning straight "A"s as an underachiever since the work he or she is doing is not any more challenging than what everyone else in the class is asked to do.

Another student may be labeled as an underachiever if he or she exhibits inferior work skills when compared with peers even if he or she is earning *A'*s or *B'*s. A third type of underachievement label might occur in a student who has superior test scores and above average intelligence, but is doing little to no work in the class (Baum, Renzulli & Herbert, 1995). The last student example provides a conundrum to the definition of an underachiever.

The producer vs. the non-producer. A term for this type of underachiever was discussed by Siegle (2013); "some have proposed the term *nonproducer*. From this perspective, students are simply electing not to do the work others may be asking them to do…the choice to be engaged is with the student" (p. 16). Delisle (1992) described the difference between gifted underachievers and non-producers. Those who do not produce are *at risk* in school but without any psychological effect; they still believe in themselves, are independent, and don't complete assignments due to boredom. On the other hand, underachievers are at risk both psychologically *and* academically. They do not complete assignments because they feel that they do not have the ability to do so and are need of more support. (Kanevsky & Keighly, 2003). These underachieving students may also miss the opportunities of being identified for gifted programs.

When identifying students for gifted programs, teacher bias was evaluated in a preliminary study conducted by Siegle and Powell (2004). In their discussion, the researchers concluded that nonproducing students, who they classified as underachieving, were not recommended for gifted programs when compared to productive students. This reinforces the fact that a non-producer is a specific type of underachiever. Educators need

to be aware that when students are not producing in class, they should check to determine if there is a problem of underachievement.

In a study presented by Figg et al., (2012), it was concluded that gifted non-producers are no different than gifted underachievers with "regard to academic self-perception [or] thinking style preference" (p. 55). In a further examination of the study, the researcher did conclude that gifted non-producers are closer in profile to gifted students who achieve than those who do not. In the discussion Figg further concluded

> This study offers the first quantitative evidence to support Delisle's (1992) observation that there is a subgroup of underachieving students that are qualitatively different and should be acknowledged as a separate group. These findings have an important implication for the field of gifted underachievement. The merit of separating non-producing students from underachieving students lies in the intervention strategies that will be adopted to address their lack of academic performance (p. 4160).

When comparing the above definitions, it would seem that researchers and theorists would generally categorize underachieving gifted students into two groups: 1) those who are chronic (Clark, 1997), anxious (Reis & McCoach, 2000), conventional (Delisle & Galbraith, 2002), and underachieving (Figg, Rogers, McCormick, & Low, 2012) and 2) those students who are situational (Clark, 1997), complacent/rebellious (Reis & McCoach, 2000), selective (Delisle & Galbraith, 2002), and selective consumers (Figg, Rogers, McCormick, & Low, 2012). Although both groups could be identified as underachieving, the first group includes the type of learner who has some type of emotional or academic piece tied into his or her underachievement, and those in the

second group have some type of choice in theirs. In other words one group of gifted underachievers have an emotional or academic reason for not achieving whereas the second group of under achievers can do the work but chose not to do what is required. However, no matter the type of underachievement, it is a problem which continues to occur in "epidemic proportions" (Rimm, 2003, p. 424). It is important therefore to examine the causes of this problem in order to understand it and work on appropriate interventions.

Causes of underachievement. Clark (1997) stated that causes for underachievement have been researched since the 1950s. No matter the type of underachievement, several reasons have been found surrounding underachievement of gifted students. Baum et al., (1995) claimed that there are four main factors that contribute to underachievement: emotional issues (from family dysfunction to perfectionism and depression), social and behavioral issues (non-conformist to written or unwritten rules of school), lack of an appropriate curriculum (no challenge in what the student is working on), learning disability and poor self-regulation (students do not know how or do not have the ability to control their learning). Several other researchers have found similar causes for underachievement.

Ford and Antoinette (1997) found that sociopsychological (poor or low self-esteem), family-related (parents having unreasonable expectations or fail to engage in school progress), and school related factors (poor student-teacher interaction, lack of challenge to work, or disinterest in school) can be linked to underachievement in students. Gallagher (1991) organized causes of underachievement into two categories: environmental (school) factors and personal/family factors. Gallagher suggests that

environmental factors can further be separated into the school environment and the student's peer group. Other researchers have found in qualitative research that peer influence is a strong cause for underachievement.

Reis and McCoach (2000) found that peer influence is the number one reason for students to underachieve. In a study conducted by Berndt (1999), it was found that grades of gifted students matched those of their non-gifted peers by the end of the year. If their friends had lower grades in the spring, then by the start of the year, the grades of gifted students were also lower.

Challenge is needed in curriculum for both producing and nonproducing students (Plucker & McIntire, 1996). Teachers may be contributing to underachievement in students. Csikzentmihalyi, Rathunde, and Whalen (1993) point out that when teachers do not expect much from their students, they will become bored. Actually, several studies have found boredom to be prevalent in underachievement.

The Area of Math

It is important to first examine who exactly is not achieving in math. Cheema and Galluzzo (2013) analyzed the results of the quantitative study from the US portion of the Program for International Student Assessment (PISA). This study evaluated math achievement from variables such as race and socioeconomic status as well as math anxiety and math self-efficacy. An ANOVA was used to complete the one-way analysis in order to determine whether mean math achievement was different in cross categorical variables. Results showed achievement gaps between Caucasian and African American students as well as between Caucasian and Hispanic students. Caucasian students outperformed Hispanic students, and Hispanic students outperformed African American

students in terms of mean math achievement. Based on this study, the group most at-risk in mathematics is African American students. In a similar study conducted by Darensbourg and Blake (2013), 167 at-risk African Americans were sampled at the primary level in order to determine if there was a relationship between task values, behavioral engagement, and academic performance. Results of the quantitative study showed that there was a correlation between behavioral engagement and those African American students most at risk for failure. Statistical significance between the effects of behavioral engagement on math achievement was apparent from fourth grade to fifth grade. It is necessary to evaluate where mathematics instruction has been successful in order to create interventions to help learners succeed.

Math achievement. There is a need to study math achievement and what holds students back from achieving to their potential in this subject. In 2005, Stoegler and Ziegler found that a large group of extremely gifted students did not achieve the levels of academic accomplishment that they are capable of reaching in the area of mathematics. In another study, Cheema and Galluzzo (2013) found that approximately 19% of the total variation in math achievement "over and above that accounted for by demographic characteristics" (p. 110) was a result of math anxiety and math self-efficacy. Unfortunately, underachievement is traceable to teachers of mathematics who fail to provide students with appropriate supports and challenges in the classroom. Wiseman (2013) found that educators do not appropriately challenge students with math potential; therefore, these students tend to underachieve. Underachieving mathematic students lack the supportive instruction they deserve due to the fact that teachers tend to focus on students who are average or below average in math due to the stressed caused by end-of-

the-year assessments (Jolly & Makel, 2010). The above research theorizes that there is a need to study math and underachieving students. It is therefore important to examine each aspect of math education.

***Success in math instruction*.** Having mentors in mathematics can help students become engaged in this subject. E-mentoring has provided a wide variety of opportunities for gifted students to connect with mentors from differing nations and career fields (Mammadov & Topcu, 2014). Self-perception and self-regulated learning can bring success to a mathematics classroom. Students who have a positive attributional style, or the belief that they can be successful in math, are more likely to perform better in their mathematics and had advanced verbal ability (Clemmons, 2005). Self-regulated learning, which has learners identifying goals they will meet while monitoring their thinking, motivation, and behavior, is a strategy that proves promising to mathematics underachievers (Pintrich, 2000). Educational psychologists believe that when students practice the ideals of self-regulated learning, improvement can lead to many positive effects, both in math class as well as other subject areas (Stoegler & Ziegler, 2005). Mentors can be strong motivators in the area of mathematics. Likewise, students who are given the opportunities to see themselves as a mathematician can become more engaged in a classroom.

In a qualitative study conducted by Mammadov & Topcu (2014), five eighth-grade middle school students who were enrolled in gifted classes in a private program in Istanbul, Turkey, were nominated to receive mentors in the area of mathematics. The students were aware that the mentors were there to help facilitate the program and that they were part of a study. During the three-week program, students worked on three

tasks, both as individuals and in groups. Throughout the program, students had contact with a mentor via Google discussions and Skype. The analysis of data showed three main emerging themes: (1) students were motivated by the complexity that the mentor provided and the technology involved in the communication with the mentor, (2) when students are provided with a support system, even using technology, they demonstrated an abundance of communication with the mentor through numerous emails and posts on discussion boards, and (3) the nature of being in a community solving math problems together found students enjoying the role of practicing professionals. While mentors can provide the necessary springboard for engagement, it is of particular note that students feel challenged by working with an expert in the field of math. Promoting challenge in math classrooms has led to engagement necessary for achievement.

Wiesman (2013) conducted a quantitative study to determine the best way to motivate and engage ninth graders in a mathematics course. One hundred and three freshman students were surveyed to determine if their mathematic courses were effective. Results of the study showed that advanced math students are mostly motivated when they have goal-oriented tasks. The researcher made suggestions for teachers based on the results of this study. It was recommended that (1) every lesson should incorporate a concept that is completely new to the advanced student, (2) students should be surveyed to determine what they know and be given opportunities for advanced curriculum based on a pre-assessment, (3) homework should be respectful and differentiated, (4) teachers should assign difficult problems to advanced students but allow them to redo assignments if they are not achieving to the goal they have set for themselves, and (5) lectures should be limited in order to provide students time to work on problems with teacher help or in

collaborative groups. It is also important to promote self-regulation in the mathematics classroom.

In a quantitative study Stoegler & Ziegler (2005) evaluated the success of self-regulated learning used by 36 mathematic underachievers in a fourth grade classroom. Students were exposed to a six week period in which they employed self-regulated practices for the purpose of reversing their underachievement. The program was administered by 12 teachers who attended a three-day workshop to learn how to use the strategies. In order to determine if the program was effective, an ANOVA was used in repeated measures. Non-parametric statistics were also used due to the population size of the sample. Results showed that there was a positive relationship between improvements in math by those students trained in the program. Self-efficacy was also slightly improved in the experimental group (Stoegler & Ziegler, 2005).

Several themes are evident throughout the cited research that can be used for future study. It must first be realized that students are underachieving due to low social emotional issues such as low self-perception, negative attitudes toward school, little engagement in class, and problems with self-regulation (Appleton, Christenson, Dongjin, & Reschly, 2006; and Blaas, 2014). Students who are successful in school share the following components: 1) positive attitudes toward school, 2) teachers who are knowledgeable about challenging students appropriately and providing support when necessary, 3) strong self-regulated skills, and 4) motivation to succeed (Abu-Hamour & Al-Hmouz, 2013; Balduf, 2009; Stoegler & Ziegler, 2005; Rubenstein, Siegle, Reis, McCoach, & Burton, 2012; and Tomlinson & Jarvis, 2014). Mathematics was also identified as having a large number of underachieving students (Cheema & Galluzzo,

2013; Mammadov & Topcu, 2014; Pintrich, 2000; and Stoegler & Ziegler, 2005). It is therefore important to find an intervention in which underachievement in mathematics can be reversed.

The Interventions

There are many reasons why non-gifted students underachieve, and like those of their gifted counterparts, it is important to examine programs that will help students reverse their underachievement. Research shows that it is important for students to be involved in their learning. Blumenfeld (1992) found that when students take ownership of activities that help with curiosity and personalization, task engagement increases. While making learning personal is important, it was also found that students need to find value in their education. Based on the expectancy-value model of achievement, students are more likely to do well in school if they find it interesting or they determine it to be important to their future goals (Eccles et al., 1983). When students find relevance to their education, engagement will increase. Evidence from several studies indicates that when the majority of students have achievement value, they are engaged in school, are persistent in their schoolwork, and perform well in their classes (Pintrich & DeGroot, 1990; Roeser, Strobel & Quihuis, 2002; Rouse & Austin, 2002). In order for students to be engaged in school, supportive environments need to be established in their educational settings.

Rogers (1961) examines the positive impacts of supportive environments. Teachers can help to make the environment supportive by acting as facilitators who make learning engaging, being on the level of the student, and empathizing with their students. As teachers provide these environments for students, success has ensued. Further studies

examined the important role of interventions in reversing underachievement among gifted underachievers.

Successful programs/interventions for students. Finding the most appropriate program or intervention that will help students reverse underachievement is important. A common theme for reversing underachievement is to improve proper motivation for students at any age. Having students find value in their education is important for a successful program (Rubenstein et al., 2012). Examining particular studies with different age groups can help guide future research.

In a meta-analytical study, Blaas (2014) found a positive correlation between students who have a strong social-emotional well-being and their academic success. One of the studies discussed in the Blaas analysis was authored by Guay, Marsh, and Boivain (2003), in which it was confirmed that having a strong self-concept influences independent academic motivation. In a related study, Clemons (2005) found that students with strong self-perceptions have an influence on their successful study and organizational skills as well as their achievement motivation. If students have a secure and strong self-perception, then they will consequently possess the necessary academic skills to provide them with academic success; it is therefore important for educators to intervene when deficits are found.

Abu-Hamour and Al-Hmouz (2013) conducted a quantitative study in which sophomore and junior low achievers were compared to high and moderate achievers. Issues such as motivation, self-regulation and attitudes toward school were examined. One hundred ninety-seven Australian students were compared using their performance in English and math. Based on results of the study, high achieving students had higher mean

scores on all the study variables (motivation, self-regulation, and attitudes toward school) than moderate and low achieving students. There was significant correlation between mathematical academic success and the study's variable with intrinsic and extrinsic motivation having the highest correlation. It was found that intrinsic and extrinsic motivation can both be used to help with academic success in high school students. This study shows the importance of motivation in high school students and how interventions should include both extrinsic and intrinsic motivators. This was also the case in elementary school students.

Success in keeping underachieving gifted students in high school depends on their academic, behavioral, affective, and cognitive engagement (Appletom, Christenson, Dongjin, & Reschly, 2006). All of these learning aspects are important when helping students achieve to their potential. In their experimental study, Valentine, Dubois, and Cooper (2004) found a strong correlation between academic performance and positive self-perception. Clemmons (2005) built on this research by studying the effects of student attitudes. He found that students require need to have positive attitudes toward school in order to achieve academically (Clemons, 2005). Positive attitudes in gifted students can also help them with their engagement in school. Appleton et al., (2006) conducted an experimental study in which they found a significant correlation between student engagement and school completion. If engagement is in place, then affective needs can be addressed.

Matthews (2006) found that less than one per cent of students drop out of high school if they are involved in some type of enrichment program taught by a qualified adult. Appropriate programming can help students not only achieve academically but also

help keep them in school. Research has shown the benefits of how this can be implemented in gifted programs.

Success in the elementary school. In a mixed methods research project conducted by Rubenstein et al., (2012), two studies were completed in which interventions were created based on the Achievement Orientation Model (Siegle & McCoach, 2005). In the first quantitative study, five treatments were created in order to increase achievement in underachieving middle school students. Each treatment addressed the following of the AOM: 1) increasing confidence in one's ability (self-efficacy), 2) finding value in a task (meaningfulness), 3) creating supportive environments in school where students found favorable situations (environmental perceptions), and 4) teaching students study skills and time management (self-regulation). Students were selected to be a part of the study based on the study's understood definition of underachievement: students performing poorly in school, based on letter grades and teacher recommendation. The study required students with grades in the bottom half of the class in reading/language arts and/or mathematics in order to be considered for the study. Participating students needed to have an IQ test score of at least 120 and/or a standardized achievement test score, administered in the last three years, having them identified in the 90th percentile. Students selected for the study were given assessments to determine their perceptions of school before the intervention and then after the intervention. Students' grades were evaluated both at the beginning and end of the intervention. Results found a correlation in the treatments where students valued goals and had positive environmental perceptions and academic success.

Based on the results of this study, three middle school students were selected for a qualitative study in which an intervention was created with the goal of making school more meaningful through alternative assignments (Rubenstein, Siegle, Reis, McCoach, & Burton, 2012). During this intervention, students worked on short- and long- term goals, matched their projects to state standards, and differentiated their own learning to match their interest to what was required of their class. Three themes emerged from this study: 1) there needs to be home support for success, 2) having a supportive adult or mentor may affect student success, and 3) underachievement interventions must be student specific (Rubenstein et al., 2012). When comparing the results of both of these studies, it is important to note that the more successful finding of the above study was the importance of creating an intervention that had students valuing a goal and working with a supportive mentor. Connecting this to the findings in the area of math will be most important to the proposed study.

Interventions for non-producing underachievers. It is important to note that the findings thus far in the literature review are that non-producers choose not to do the work. Therefore, interventions for these types of learners should involve options that are desirable to students who desire the work. Thompson and McDonald (2007) studied sixth grade students who were classified as gifted achievers and underachievers in the population. Students were given teacher-constructed and student-constructed assignments to determine what might reverse underachievement in the more intellectual students. Research questions included the following: (1) How might teacher-constructed and student-constructed assignment structures affect achieving and underachieving performance patterns and (2) how do the following types of students respond to the

aforementioned assignment structures: gifted achievers, advanced achievers, gifted underachievers, and advanced underachievers (pg. 200). Results showed that both gifted achievers and underachievers preferred the student-constructed assignments and self-assessments. Suggestions, based on research findings, were as follows: (1) allow students to be collaborators in learning, (2) provide choice because it provides students with a personal connection, (3) guide students' learning and (4) know the learner and his or her learning style (Thompson & McDonald, 2007). This type of intervention involves making the assignments more student driven and of interest to them. Non-producers respect those who understand and design projects around them (Kanevsky & Keighley, 2003). It is important for educators to realize this when designing interventions for students who are choosing not to do the work that is being asked of them. A different type of approach is needed for underachievers who might have some type of emotional block or academic challenge during learning.

Interventions for emotional/academic underachievers. When working with underachieving producers or students who do not have the choice to underachieve, teachers must employ some type of intervention in which they attempt to cause the learners to change their mindset either about their learning or the belief in their work. Morisano and Shore (2010) analyzed psychological studies in order to recommend a goal-setting approach for reversing underachievement in gifted students. Their research addressed the identification of underachievers as well as questions about motivation, future research, and reasons for loss of motivation and underachievement. It also addressed what has currently been implemented to reverse underachievement. The

authors cited successful research on goal-setting and how that could be applicable to helping reverse underachievement.

This research dictates that educators must design individual programs, such as goal-setting, for underachieving gifted students, much like special education students have their individualized education plans (IEP). An underachieving gifted student will need the support of not only the educator but also of the parent and the counselor. All parties will need to be a part of the underachiever's "IEP" in order for it to be effective (Ford & Thomas, 1997). The success of this plan should include a choice of interventions for the different types of underachieving gifted student. Much like an IEP, the intervention will be differentiated and could include such gifted strategies as acceleration, enrichment, curriculum compacting, metacognition activities, additional depth and complexity, and periodical parent conferences with the counselor (Reis & McCoach, 2000).

It should be noted that if an educator individualizes a plan of action to reverse underachievement, it must allow the educator to touch base with the student frequently. When educators make sure to "check in" with their underachievers, they can help them succeed (Baum et al., 1995; Reis & McCoach, 2000). This should include helping students believe in their abilities with proper motivation, establishing an engaging environment and having appropriate parental support. When these pieces are in place, the puzzle of the underachiever could possibly be solved. Individual counseling may help the *emotional* and *academic* underachiever, while student-designed projects may help the *non-producing* underachiever. Educators are faced with having several types of

underachievement in the classroom, so it is important to find interventions that could meet the needs of many types of underachievers.

Interventions for both types of underachievers. After the definition is understood about the kinds of underachieving gifted students that exist, appropriate interventions can be decided. Educators who have these students in their classes need to identify and plan for the kinds of students they will encounter. It is important to work on interventions early. Wellisch and Brown (2012) proposed a plan for early intervention. This plan includes stronger identification policies which would allow educators to help gifted students be successful in their programs. The plan outlined a way to provide gifted instruction while supporting possible learning disabilities. The plan is also sensitive to social/emotional problems that may occur due to being a gifted underachiever. By identifying learners who are not achieving early, interventions can be put in place to help students successfully realize their potential. Early detection of underachievement will also mean better placement.

Also examined is the way students are placed in classes and what strategies are used to instruct them. Matthews and McBee (2007) suggested that by matching ability to the curriculum, the needs are met by the many types of underachiever. Implications of their study also suggested that by making curricular modifications in the classroom, underachievement can possibly be overturned. When making decisions to effectively deliver instruction, knowing the types of underachievement in a classroom will enable educators to design appropriate programs. A researched intervention that takes into account the different facets of underachievement was developed to help educators make such a decision.

Rubenstein et al., (2012) explored two studies that used the "Achievement Orientation Model" as an intervention for gifted students. This model uses a three-ringed approach to reversing achievement with the parents, teachers, and students closely involved in the process. Student engagement increases when underachieving gifted students find meaning to a task and feel that they have the skills and support to accomplish that task. Results showed that; (1) if a student is not in a supportive home environment, he or she has a stronger chance of not achieving at school, (2) if a student sees an involved adult, even if the parent just signs a contract agreeing that he or she will help the child in school, that student is more likely to succeed, and (3) when underachievement plans are specific, an underachieving student may reverse his or her achievement in school (Rubenstein et al., 2012). The researchers expounded on the goal-setting piece.

Goal-setting not only can reverse underachievement, but it can also positively affect other negative issues as well. Reis and McCoach (2000) explained that encouraging gifted students to work towards personal, motivating goals helps them with both with school and life in general. Reis & McCoach (2000) stated:

> Underachievers are a very heterogeneous group. Like gifted students in general, they exhibit great variability and diversity in their behaviors, interests, and abilities. Because students underachieve for so many different reasons, no one intervention strategy can possibly reverse these behaviors in all underachieving gifted students. We need to individualize programs for underachieving gifted students at least as much as we individualize programs for achieving gifted students (p. 152).

In a meta-analysis conducted by Fong, Snyder, Barr, and Patall (2014), the researchers examined the effectiveness of 62 intervention programs by evaluating the

overall effectiveness for interventions. The analysis also investigated if psychological outcomes differ by grade level, the sample, the kind of intervention, or the focus of the intervention. Their study resulted in major findings; (1) Counseling-based interventions were more effective for underachievers than interventions focusing only on curriculum, (2) Interventions that focused on motivation were more effective on those students who were non-producers, and (3) Interventions that focused on student attitude, self-belief, and self-regulation were effective in producing a psychological mindset change. Fong et al., (2014) made further recommendations from their study: (1) due to the effectiveness of interventions at younger ages, these programs should be administered at that level, (2) educators should not stop trying to find interventions for college underachievers, (3) intervention programs should be designed for the particular educational environment, and (4) an intervention that gives an overall dosage of 10-18 hours is the most beneficial. Based on this analysis, programs are most effective at elementary and middle school. However, educators at secondary levels, high school and college, are also faced with underachieving gifted students. Appropriate programs need to be implemented to help those students as well.

An intervention based on goal-valuation. It was determined that one possible explanation for underachievement is students are not valuing the task, have little motivation, or are not exhibiting self-regulated skills (Rubenstein et al., 2012). When a person values a goal/task or finds a goal/task that initiates great interest, it may lead to the motivation needed to complete the task. Even when a person is unsure he will be successful at completing the task, he will still put effort in the task because he values it (Siegle & McCoach, 2011). Different types of goal valuation exist. Watt, Shapka, Morris,

Durik, Keating, and Eccles (2012) identified three types of goal valuation: intrinsic value, extrinsic value, and attainment value. In order to understand these values, it is important to discuss each in detail.

When a student not only enjoys but finds relevance in the task, intrinsic value is created (Siegle & McCoach, 2011). Students will seek out activities that are somewhat entertaining, alluring, gratifying, and appropriately challenging. Students will lose interest if they find no challenge in the task (Siegle & McCoah, 2011). However, students will give up if what is being asked is too challenging (Deci & Ryan, 1985). Educators can provide opportunities for students to explore their interest. In a recent study, an intervention for underachieving students was put in place. These students were allowed to select enrichment projects based on their interest. It was found when students were allowed to choose projects that tapped into their strengths and gave them relevance, underachievement was overcome in over fifty percent of the sample (Baum et al., 1995).

Students who feel the task is important will persist longer on it (Schunk, Meece, Pintrich, 2014). These students have attainment value for that task. For example, students who feel that they are actors will set goals that an actor would set for himself, or those who feel that academics are important will set the goal of getting good grades. Students are driven to achieve these goals because they relate it to the perception they hold about themselves. In order to help students increase their attainment value, models could be provided who hold the same value. Rimm (1995) discovered that students responded better to models who were of their gender and had their same goals. When educators help students become personally invested in their education, it makes content meaningful and therefore assists in motivation (Siegle & McCoach, 2011).

A utility value is more of an extrinsic reason for completing a task. According to Widfield and Eccles (2000), "The student doesn't complete the task to have it finished, but does the task to get to a bigger reward" (p.73). The student will complete the task in order to meet a future goal. Students can be supported with utility values by having the opportunity to see beyond the current task. Siegle and McCoach (2011) assert that "Research on gifted underachievers has demonstrated the importance of valuing academic and career goals on students' eventual reversal of their underachievement" (para. 6).

In order to make future contributions to the study of underachievement, it is the intention of this researcher to replicate a study that was conducted by Rubenstein et al., (2012) by focusing on goal valuation in a high school mathematics class. Strategies will be used with students identified as underachieving in an advanced level math course in order to increase their goal valuation, motivation, and self-regulated skills. Both the math and gifted resource teachers will be trained using established programs, and they will collaborate to provide appropriate rewards, feedback, and conferences to help students receiving the intervention be successful in the advanced math class. It is the hope that the replicated intervention generalizes across time, using different age groups, and in a different community.

Considerations for successfully reversing underachievement

When addressing needs to help reverse underachievement in both those students who have *emotional* and *academic* problems and those who are *choosing* not to achieve, the first look should be what these types of learners need in order to be considered for interventional programs. Engagement is one aspect that will help both types of

underachievers. Fredricks, Blumenfeld, and Alison (2004) identified three types of engagement: behavioral, emotional, and cognitive. Behavioral engagement is student participation in school-related activities, and emotional engagement includes how students react to the school environment. Cognitive engagement is a student's willingness to put forth the effort of accomplishing the goals of their academics. Though the researchers did find a direct correlation between these types of engagement increasing student achievement in the literature, they found gaps such as what a multidimensional conceptualization of engagement offers. The researchers suggested that further research in this area may lead to effective intervention programs. While student engagement is important, it is also worthwhile to address students' interest (Siegle, Rubenstein, Pollard & Romey, 2010), thereby providing engaging opportunities for underachieving students.

In their study, Baum et al., (1995) found that students identified as achieving by their teachers when exposed to an activity that engaged them in investigating and solving a problem of their interest. Results of the study also showed the following contributors for students' success; (1) individualized and respectful relationship with their teacher, (2) the practice of student self-regulation, (3) opportunities to investigate why they were underachievers, (4) the ability to study based on their interest, and (5) the choice to work with like-minded peers. Another piece to be considered when discussing engagement and interest is the teacher themselves. It is important for teachers to be involved in the process of reversing any type of underachievement.

Vygotsky (1978) discussed the "zone of proximal development." This occurs when a teacher creates a problem that is above a student's skill level that a student needs to solve with the teacher on "standby" to help if needed. Therefore, students are

appropriately challenged, and the teacher can move freely among learners. This may solve the problem of boredom for the non-producer. Kanevsky and Keighley (2003) found that non-producers in their study respected teachers who were interested in their learning. They continued to discuss that teachers should also do the following: (1) ask students about their boredom, (2) question them with techniques that will probe for deep understanding, and (3) modify their learning experiences based on these conversations. When learning situations are modified, underachievement can be appropriately addressed.

Similar research was conducted by Kanevsky and Keighley (2003), in which it was found that in order to meet the needs of gifted students, their programs should contain the "five Cs." Kanevsky and Keighley (2003) described their "five C" theory, which they developed based on their boredom research. Findings of the study resulted in students needing control, choice, challenge, complexity, and caring teachers. Both groups of researchers agree that in order to combat underachievement, students need control, complexity/challenge, choice, and caring teachers. Kanevsky and Keighley explained that students became disengaged in their learning mostly in their middle and high school years, and as the five C's dissipated, students became non-producers. Interventions have been created to address these considerations. Certain interventions are more appropriate for certain types of learners. Some interventions will help those who are underachieving academically and emotionally, and others will help those who choose not to produce. There are interventions that are also appropriate for both types of underachievement.

Furthering the Field of Gifted Education

The field of gifted research in this area demonstrates many complexities, and provides many aspects that can be expanded and clarified through further research. One of the main ideas to underscore is that gifted education is an important part of our society's educational culture, which is filled with superior researchers, theorists, educators, and practitioners (Dai, 2011). Each of these groups think innovatively and bring valuable ideologies to propel this field. However, in order for the field of gifted education to continue with initiating purposeful change, there needs to be more of a collaboration between researchers, theorists, and practitioners (Carman, 2013, Dai, 2011; Subotnik et al., 2011).

Student beliefs guide achievement and motivation. In order for researchers and teachers to truly understand gifted learners, research must be conducted on how these learners think and what they believe. Assouline et al., (2006) assert that, "Practitioners need to realize that gifted students, certainly those for whom giftedness has been publicly identified, are aware of the role that ability plays in their academic success" (p. 283). Results of their study found that boys felt they could be successful based on how smart they are, whereas girls based it on how hard they worked. Both boys and girls felt they didn't work as hard as they could in their academic areas. More students felt that failure was due to not working hard compared to how intelligent they tested. Students identified that how hard they worked (effort), not how smart they are (ability) did impact if they were successful in a class. It is therefore important for practitioners in the field to know the results of this study and how these learners choose to succeed in gifted programs. Some gifted learners choose to either succeed or not succeed in life. Figg, Rogers, McCormick,

and Low (2012) identified this learner as the "selective" gifted learner. In their study, they found that this type of learner had higher self-perceptions and a different thinking skill set than other underachievers. The results of their study showed that selective consumers, or students who attend school to "buy" knowledge, had a higher belief in their abilities, a good attitude toward their teacher and class, higher motivation and self-regulation. However, selective consumers expressed less positive attitudes towards school in general, causing them to underachieve. Researchers should help guide practitioners to be aware of the thought process behind these kinds of learners. According to Schommer (1994), teachers need to be aware of the "epistemological beliefs" of the gifted child in the classroom. He found that "research evidence is accumulating that suggests that epistemological beliefs may help or hinder student cognition. It appears that even the gifted are not immune to beliefs that may have disabling effects" (p. 207). Schommers' study found that when students enter high school, there is really no difference in epistemological beliefs between gifted learners and non-gifted learners. However, by the end of high school, gifted learners realize that knowledge acquisition is gradual and complex.

Of particular interest to the study will be a meta-analytical study conducted by Fong, Snyder, Barr, and Patall (2014). This analysis examined the results of 53 studies using 62 interventions for achievement. It was concluded that an intervention is more successful if it focuses on counseling the student as well as improving curriculum. Interventions that focused on students' perception of their learning helped improve achievement, while programs that "focused on students' attributions, self-beliefs, and self-regulation were most effective for evoking change in psychological outcomes" (p. 15). This research helps to solidify the intervention which will be replicated.

A goal valuation intervention. The intervention itself was developed by Rubenstein et al., (2012). In this study classroom strategies were put in place that increased goal-valuation, specifically including intrinsic, attainment and utility values with rewards effectively given at completion of tasks. These values will be considered when implementing the intervention. Watt, Shapka, Morris, Durik, Keating, and Eccles (2012) found that when students have intrinsic value, they tend to find interest in the task. Those with extrinsic motivation have a utility value. If a student finds that the task is important in defining their identity, they have attainment value. That this type of intervention has not been completed at the high school level shows research is lacking. It is of particular interest to the researcher if an intervention of this caliber will work with high school students. Based on the success of the goal valuation intervention that was used with underachieving gifted elementary students, it is the hope that this will have transferability with a different demographic and geographical location.

At the heart of this study is moving gifted education forward. Hopefully the research will prove that giftedness can be nurtured, that it supports other research findings, and that it will successfully help underachieving students. All types of gifted learners deserve the most appropriate programming in order to achieve life-long success. If the study achieves its goals, it will add to the field of gifted education by giving a viable solution to a complex problem.

CHAPTER III: METHODOLOGY

A growing number of capable students are not offered challenging classes, and many more are placed with teachers and fellow students who do not challenge them (Phillips & Lindsay, 2006). At the same time, teachers, administrators, and parents alike are perplexed by the fact that identified gifted students are failing many of their academic subjects. Kim (2008) suggests that there is a correlation between this lack of student engagement and the underachievement of students identified as gifted. In order for students to be engaged, students must find value in the subject matter they are required to learn. Even though learners may not appreciate the subject matter, if they find value for specific tasks they can be successful (Wigfield, 1994). Often there is a disconnect between instructors and students regarding the value of a particular learning experience. As a result some instructors may find that a learning experience is worthwhile, yet students may not find value in that same experience (Siegle & McCoach, 2005). Students who embody self-regulation and study skills, in essence, have higher self-efficacy, which helps them with achievement (Reis & Rubin, 2004). If curriculum is modified in order to match students' abilities and interests, underachievement could possibly be mitigated (Matthews & McBee, 2007). The proposed study addressed underachievement in a higher level math course for learners identified as either intellectually gifted or non-gifted by a large southeastern Virginia school system.

Purpose Statement

The purpose of this study was to compare the overall academic attitudes (i.e., self-perception, motivation/self-regulation, goal valuation, attitudes toward teachers, and

attitudes towards school) and academic performance of two groups of students, one group undergoing an intervention designed to aid students with goal-setting and a control group receiving no such intervention. Each group will be comprised of 1) underachieving gifted students, 2) achieving gifted students, 3) underachieving non-identified students, and 4) achieving non-identified students, enrolled in a higher level mathematics course.

This intervention was a partial replication of a study conducted by Rubenstein, Siegle, Reis, McCoach, & Burton, (2012). In their 2012 study it was found that out of five intervention for gifted students, goal valuation was the intervention that had the most statistical significance. Based on this finding the researcher of this study used that sole intervention to compare academic attitudes and academic performance.

The classroom and gifted resource teachers at a local high school collaborated in an attempt to reverse students' underacheivement in a higher level math course using the goal valuation intervention from the Rubenstein et al. study.

Research Questions and Hypotheses

The research questions that were addressed in the study, along with their corresponding hypotheses, are included below. Some researchers would likely posit null hypotheses for each of this study's quantitative research questions (i.e., hypotheses predicting no differences between the control and experimental groups) on the grounds that interventions among high school-aged students do not prove effective because they come too late (Whitmore, 1986; Anderson, & Keith, 1997; Diaz, 1998). In this case, though, the researcher asserted directional, alternative hypotheses for each of the quantitative research questions. Because of the philosophical underpinnings of

qualitative inquiry, on the other hand, no hypothesis was asserted for the qualitative research question (i.e., question five, below) which was explored in this study.

The main research questions answered by this study, along with their corresponding hypotheses were as follows:

1. How do underachieving gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of overall academic attitudes?

    a. Hypothesis: underachieving gifted high school students who participate in the personal goal-setting intervention will demonstrate more positive overall academic attitudes than will their non-participating peers.

2. How do underachieving gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of actual academic performance?

    a. Hypothesis: underachieving gifted high school students who participate in the personal goal-setting intervention will demonstrate more academic performance than will their non-participating peers.

3. How do underachieving non-gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of overall academic attitudes?

    a. Hypothesis: underachieving high school students not identified as gifted who participate in the personal goal-setting intervention will demonstrate more positive overall academic attitudes than will their non-participating peers.

4. How do underachieving non-gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of actual academic performance?
    a. Hypothesis: underachieving high school students not identified as gifted who participate in the personal goal-setting intervention will demonstrate more academic performance than will their non-participating peers.
5. In what ways do participating students value a goal setting intervention as it relates to a higher level mathematics course?

Study Design

The study followed a mixed methods design with a true experimental elements and a qualitative case study element. Measurements were conducted in order to compare all the control group and its subgroups to the experimental group and its subgroups in terms of overall academic attitudes as measured by the School Attitude Assessment Survey–Revised (SAAS-R; McCoach & Siegle, 2003) and academic performance. Academic performance was measured by using grades derived from the participating students in the math analysis course at three different intervals; 1st Interval at 4 weeks into the course, 2nd Interval at 8 weeks into the course, and 3rd Interval at 12 weeks into the course (Figure 2). Qualitative data collection occurred during one-on-one interviews to determine if a goal setting intervention was worthwhile in an advanced mathematics course.

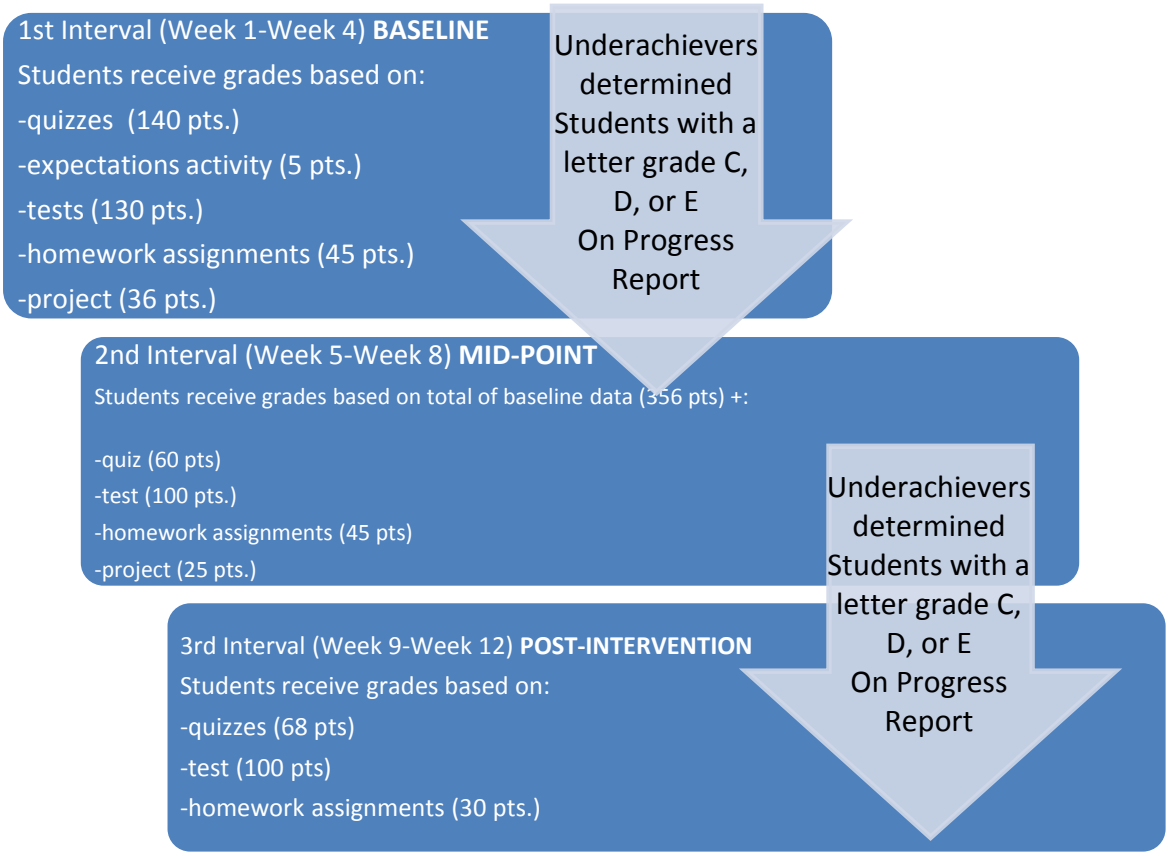

Figure 2. Intervals of quantitative data collection

The intervention was administered to the experimental group over a nine-week period during the 2nd and 3rd Intervals. The SAAS-R, the Exit Questionnaire-Revised, and a review of grades after the intervention helped the researcher draw conclusions about the intervention and the students' math academic attitudes and academic performance. These steps follow the Pretest-Posttest Control Group Design.

Population and Sample

In order to work with participants an Informed Consent Document was approved by both the university and the school system (Appendix A). The research was conducted at a large public high school in southeastern Virginia. This high school is comprised of

1,989 students from low to mid-high socioeconomic backgrounds. There are 264 identified gifted students at the high school where the intervention took place. Thirty-eight of the gifted students (14%) were identified as "underachieving" at the 1st Interval. Underachieving students, as defined by this school system, have received a D or E in English, science, social studies, or math in any of the four grading quarters throughout the school year. At the 1st Interval, there were two underachieving gifted students enrolled in math analysis as defined by the school system. This is five percent of the underachieving population.

The school system where the study took place considers students underachieving if they receive a D or E in English, math, science, or social studies. It is the belief of the school system that gifted students should be able to get at least a C in their core subject areas (Local Plan for Gifted Education, 2015).

Math analysis is a higher level math course, and students enrolled in the course were recommended by the previous year's math teacher. These recommended students never received a grade lower than a B in a previous math class. It was expected by recommending teachers that students would continue receiving these grades in math analysis. The students that were used in this study were defined as underachieving if they were not performing academically as predicted. In other words if students have received a C, D, or E at the 1st quarter progress report in math analysis they were considered underachieving for the purpose of this study.

During the 2015-2016 school year, at the 1st Interval, there were 48 total students (comprised of thirty-four tenth graders, ten eleventh graders, and four twelfth graders) enrolled in the two math analysis classes which were used in this study. Twenty-eight

students were identified as gifted and twenty were non-gifted. During this study, a total of fifteen students or 31% of the population were considered underachieving. Of these 15 students, nine were identified as gifted, and six were identified as non-gifted. Out of the twenty-seven males and twenty-one females, thirty-seven were Caucasian, four were Hispanic, one was Asian, four were African American and two were identified as two or more ethnicities. In order to accomplish random assignment of gifted students to treatment conditions, it was most appropriate for a random number generator to be used. Random assignment to groups was used by creating an alphabetized list of gifted student participants, assigning each of these students a unique, sequential number and, using a random number generator to select participants, each of whom was alternatingly assigned to either the control or treatment group. This component of the grouping process can be understood as non-proportional quota-based random assignment. The school's electronic scheduling program was implemented to randomly assign the non-gifted student participants to one of the two groups. At the beginning of the school year there were 30 students in the treatment group (15 gifted students and 15 non-gifted students) 30 students in the control group (17 gifted students and 13 non-gifted students) Before the study began eight students withdrew from the treatment group leaving eleven gifted students and eleven non-gifted students in in this group. Likewise four students withdrew from the control group leaving seventeen gifted students, and nine non-gifted students in this group for the study.

Students involved in the study were given a Student Assent Form in order to get their permission to participate in the study (See Appendix B). The math analysis teacher

was given a Participant Consent Form in order to get her permission for involvement as well (See Appendix C).

Twenty-one students in the treatment group had an additional study block within the school day and participated in qualitative interviews for the study. Students involved in the qualitative component of the study met with the gifted resource teacher once a week for 10-15 minutes during their study block. These students received qualitative questions (Appendix D) which helped to answer the fifth question of the study.

Both groups of participants participated in the regular math analysis curriculum with the same teacher. As is the participating teacher's standard practice, if students in either group struggled with content, he/she received help from the teacher before or after school as well as during their study block. Both groups were also given the same assignments and assessments to measure their knowledge in math analysis.

All students in the experimental group met with the gifted resource teacher (the researcher) for 10-15 minutes a week to complete different goal-setting exercises (Appendices E-M). Each week, students set goals which were discussed the following week. It was the intent of the researcher to determine whether the intervention impacted students' achievement. If a statistically significant difference between treatment and control groups was identified, indicating that the intervention did positively impact student achievement among the experimental group, then those underachieving students who did not receive the intervention would begin to receive the treatment later in the school year.

Qualitative research design. Qualitative data were organized systematically in order to report findings from the goal-setting sessions and interviews in a logical manner.

The design, procedures, traditions, paradigm, researcher's role, data collection, data analysis, and ethics of the study will be discussed following this paragraph.

The qualitative component was designed as a case study with the students in the experimental group as the case. In order for this to be a considered a case, it was bounded and researched for a period of time (Hays & Singh, 2012). The students in this case study were bound by the geographical area, the school, the course, the teacher, and the time of day the course was offered. This group of students were researched in-depth for a total period of 12 weeks and examined as they interacted individually to the intervention (Yin, 2003). The purpose of this case study was to determine if a goal-setting intervention could help students improve academic performance and academic attitudes in a higher level mathematics course (Hays & Sing, 2012). Though the idea of case study itself is challenging (Hays & Sing, 2012), the researcher created the design with the following in mind: 1) the researcher recorded interviews and made sure to ask follow up questions which were flexible and unbiased; 2) the researcher followed proper qualitative protocol (structured interviews, field notes, careful storage, record management, etc.); and 3) potential case study ideas were researched thoroughly before being used in data collection (Yin, 2003).

The case in this study was categorized as a collective case study since the purpose of the study was to take multiple cases, the students and their views of the goal valuation intervention, in order to investigate a phenomenon of this particular population (Stake, 2005). Participants' answers to interview questions were analyzed in order to determine if there was a commonality among answers.

Qualitative research paradigm. The research paradigm is the way in which the

researcher will conceptualize the philosophy of the research question to be addressed in the study (Hays & Sing, 2012). The tradition of this case study was a positivism paradigm since the researcher "arrived at an objective universal truth through direct observation and experience of phenomena" (Hays & Sing, 2012, pg. 39). It was the goal to use empirical research in order to make meaning of how students reacted to the experience of the intervention (Patton, 2002). For this to happen boundaries were set between researcher and participants, avoiding outside discussion, and using statistical procedures to control variables as much as possible (Galuzzo, Hilldurp, Hayes, & Erford, 2008). The researcher further followed the precedent of positivism by establishing a treatment and control group with randomized sampling procedures, defining terms of the study, and objectively measuring responses to the intervention (Hays & Sing, 2012).

Role of the researcher. The role of researcher plays a symbiotic part in the research process because of the relationship between the gifted participants that developed prior to their enrollment in math analysis (Jacson, 2013). The researcher is a white, middle-class female who is the gifted resource teacher at the school where the study took place. The participants and the researcher have interacted at the school through meetings that were held their freshman year as well as their participation in the gifted club. There are some close relationships between the participants' guardians and families which had been cultivated over a few years.

The relationship forged between the researcher and the participants allowed for engagement in authentic and critical research methods (Hays & Singh, 2012). This kind of engagement was essential in order for the researcher to gain a deeper understanding of the participants' knowledge systems (Hays & Singh, 2012). Yin (2012) suggested that in

order for the research to describe authentic learning and meaning the researcher must implement methods that allow for closeness to the case. This relationship between the researcher and participants allowed for genuine discourse, in turn leading to more authentic data (Paris, 2011). This authenticity was reflected in the answers given by the participants which will be discussed in chapter four.

Reflexive journaling, which occurred during data collection, happened organically. The journaling allowed the researcher to reflect on the reactions to and interpretations of the data. Through this process the researcher became a kind of lens into the research itself (Stake, 1995). Reflexivity lent itself to the credibility and trustworthiness of the study (Hays & Singh, 2012). See Appendix AA for journal excerpt.

Measures

The study used several different measures—questionnaires, student grades, and a semi-structured qualitative interview protocol. Each of these measures had a distinct role to play in the study's overall data collection plan.

Quantitative instruments. Three instruments were used in this study. Each is described in detail below.

***School Attitude Assessment Survey—Revised*.** The first measure that was used in order to determine attitudes about school was the School Attitude Assessment Survey–Revised (SAAS-R; McCoach & Siegle, 2003). This instrument helped the researcher to examine participants' academic attitudes. The SAAS-R is a 35-item questionnaire that measures students' attitudes toward schooling in the following five discreet sub-scales, each with demonstrated internal consistency (McCoach & Siegle, 2003): Academic Self-Perceptions ($\alpha = .86$), Attitude Toward School ($\alpha = .89$), Attitude Toward Teachers ($\alpha =$

.87), Goal Valuation (α = .89), and Motivation/Self-Regulation (α = .91). Participants answered items on these factors using a 7-point Likert-type scale, ranging from *Strongly Disagree* (1) to *Strongly Agree* (7). In the past, the SAAS-R has demonstrated validity for use in gifted achievers and underachievers, as well as for non-gifted achievers and underachievers (McCoach & Siegle, 2003; Suldo, Shaffer, & Shaunessy, 2005). The SAAS-R was administered to student participants in this study pre-intervention and post-intervention to test for differences in self-reported academic attitudes across the intervention period. Examples of questions for the five factors measured are located in Table 3 and a copy of the instrument is provided in Appendix N.

Table 3

SAAS-R Example Items by Factor

Factor	**Item Example**
Academic Self-Perception	I am smart in school.
Academic Self-Perception	I am capable of getting straight A's.
Motivation/Self-Regulation	I spend a lot of time on my schoolwork.
Motivation/Self-Regulation	I work hard at school.
Goal Valuation	Doing well in school is one of my goals.
Goal Valuation	It's important for me to get good grades in school.

Attitudes Towards Teachers	I relate well to my teachers.
Attitudes Towards Teachers	My teachers make learning interesting.
Attitudes Towards School	This is a good school.
Attitudes Towards School	I am glad that I go to this school.

***Student grades*.** Student assignments completed in the math analysis course were used to accomplish two purposes in this study. First, since the school system defines an underachiever as an identified gifted learner receiving a grade below a C in the course of interest, students' assignments allowed the researcher to identify the underachieving gifted students from among all the student participants. Next, math analysis grades were the bases on which students' pre- and post-intervention academic performance was evaluated. The students' grades were analyzed at the beginning of the intervention during the 1st Interval, which was the first quarter progress report, in order to determine who was underachieving in the experimental and control groups. A review of the participating teacher's current gradebook indicated that grades recorded prior to the progress report included but were not limited to the following: unit tests, homework, project grades, and quizzes. Academic performance was again assessed at the 2nd Interval. The grades of students in both the experimental and control groups were analyzed. Grades such as unit tests, homework, project grades, presentations and quizzes were used to determine the first marking period grade. Next, the grades accrued prior to the first progress report were compared to those accrued between the first progress report and the first report card (i.e.,

the half-way point of the intervention). Finally, at the conclusion of the intervention, all three intervals were compared.

Exit Questionnaire—Revised. An exit questionnaire was administered to all student participants within the treatment group immediately after the last intervention session. This questionnaire was adapted from the *Exit Questionnaire,* created by Sivaraman (2012), used with her permission (see Appendix O) and referred to in this study as the Exit Questionnaire – Revised. Students responded to 10 items, which asked them to evaluate aspects of the intervention such as whether they liked the intervention, whether they would recommend the intervention to their friends, whether they would be willing to participate in more goal-setting exercises, and whether they thought the intervention was worthwhile to them. Items were graded on a 7-point Likert-type scale, ranging from *Strongly Disagree* (1) to *Strongly Agree* (7). This instrument provided quantitative data to gauge students' opinions of the intervention and to determine whether having positive opinions about the intervention and goal-setting, in general, can be associated with any change in students' actual academic performance.

Qualitative data collection. In order to collect qualitative data, 22 high school schedules had to be organized so that the interviewer had anywhere from five to fifteen minutes with each participant per week. Since the interview is case study's most important source (Yin, 2014), it was important to make sure the interviews occurred in a non-threatening environment. Each week the math analysis teacher and students received a schedule of the time the researcher was to meet in order to implement the intervention as well as the qualitative questions (See Appendices Q-Y). The researcher conducted the interviews and would meet with the teacher to discuss findings. This prolonged

engagement, where the researcher was immersed in the field during the research was a way to bring credibility to the study (Hays & Singh, 2012).

Before students entered the site the researcher had to: 1) identify where the participants would be interviewed; 2) have permission to use the site; 3) plan how the interview would happen at the site; 4) decide the length of time each student would be at the site; and 4) predict what might go wrong at the site (Hays & Singh, 2014). Students met with the researcher in the gifted resource room that was secluded from other students. As participants entered the room, the researcher greeted them and invited students to sit opposite of her. Before each intervention the researcher checked in with the participant by asking them to evaluate their progress in math analysis. Once the lines of communication were open the researcher would turn attention to the intervention worksheet of the week (See Appendices E-M). As the researcher would ask each question on the intervention sheet, answers would be recorded on the sheet. Once the activity of the worksheet was complete the researcher would then ask that week's qualitative question from the Exit Questionnaire - Revised (Appendix O) and record the answer. At the conclusion of the interview the researcher would give the student the next time they were going to meet and then remind him or her about the goal they set for the week. The researcher would ask the participant if he or she had any questions before they returned to class. After all questions were answered the participant would exit the field (Hays & Singh, 2014).

The researcher engaged in constant informal member checking in between each of the interviews and summarized the conversations in a reflexive journal. This process was borrowed from the ethnographic tradition to emphasize informal data collection which

was gathered through prolonged engagement and observations (Lincoln & Guba, 1995; MacDonald, 2001). Field notes were recorded in the researcher's reflexive journal throughout the research process. An audit trail with all the notes, codes, interviews, etc. has been created in order to keep the necessary records for the research that was conducted (Singh & Hays, 2012).

Quantitative analysis. Data were organized in a way that was easy to analyze and understand, relating to the research questions and using inferential statistics. Because the design of the proposed project allowed for simple comparisons between the two participating groups of students, the analyses needed in order to compare such demographically similar students was basic and straightforward. Since the data resulting from the grading, SAAS-R, and Goal Setting Exit Questionnaire-Revised instruments were ordinal, interval, or scale, a series of *t*-tests were used to determine if analyses of variance (ANOVA's) or analyses of covariance (ANCOVA's) were to be implemented in order to identify post-intervention differences between the control and experimental group students. If ANCOVAs were used, data were analyzed to covary for pre-intervention scores and attitudes/beliefs in order to control for pre-intervention differences between participants. Descriptive statistics were used to report comparisons during the three different intervals to examine the overall mean scores for academic performance. Descriptive statistics were also used to examine mean scores for academic attitudes, and exit questionnaire items. Descriptive data allows the researcher to make quick observational analyses.

Qualitative instruments. Two instruments were used in this study. Each is described in detail below.

Conference worksheets. Qualitative instruments which were used were the worksheets that were implemented during the intervention. Each week, participants answered goal-setting questions and completed goal-setting activities. All twenty-two participants completed these questions/activities. Questions included, but were not limited to, topics such as evaluating performance in the class, determining when the most effort is put forth, finding ways of improving performance in the class, and verbalizing the rewards that are valued when goals are met (See Appendices E-M).These nine worksheets, developed by Betsy McCoach (2011), were completed with each participant in the experimental group. Each participant would meet with the researcher in order to complete the worksheet which had the participant answering questions or completing activities based on goal valuation. These meetings took place weekly for 10-15 minutes in which the students answered questions and set goals they were to meet within the week. Each participant met with the researcher a total of nine times.

Semi-structured interview protocol. One-on-one goal setting sessions totaled approximately 45-60 minutes per student throughout the nine week intervention. Students who had an additional study block assigned for the 2015-2016 school year were asked one or two questions per week that followed a semi-structured approach for approximately 5-10 minutes during this study block time. These questions were based on the intervention worksheets and were created by the researcher in order for participants to elaborate on ideas from the individual goal valuation study. For example, week two of the intervention had participants evaluating how well they were doing in school and what they needed in order to do well in school. The first question of the individual interview built upon this idea by asking students specific skills needed in order to be successful in

class. Additionally, the researcher asked clarifying questions which pertained to the individual participants' answers. Questions included, but were not limited to, topics such as learning behavior, importance of values, future goals, and thoughts about the goal-setting intervention (Appendix D). This interview protocol was developed by the researcher for use in this study.

Procedures

Due to the mixed methodological approach implemented in this research study, specific procedures were followed. Some of these procedures happened simultaneously as the study progressed. Below details of the quantitative and qualitative procedures are discussed. Figure 3 gives an overall flow chart of how these occur in sequence. There are some processes that need to happen both for quantitative and qualitative study. Before qualitative data could be collected a research paradigm and its tradition needed to be decided.

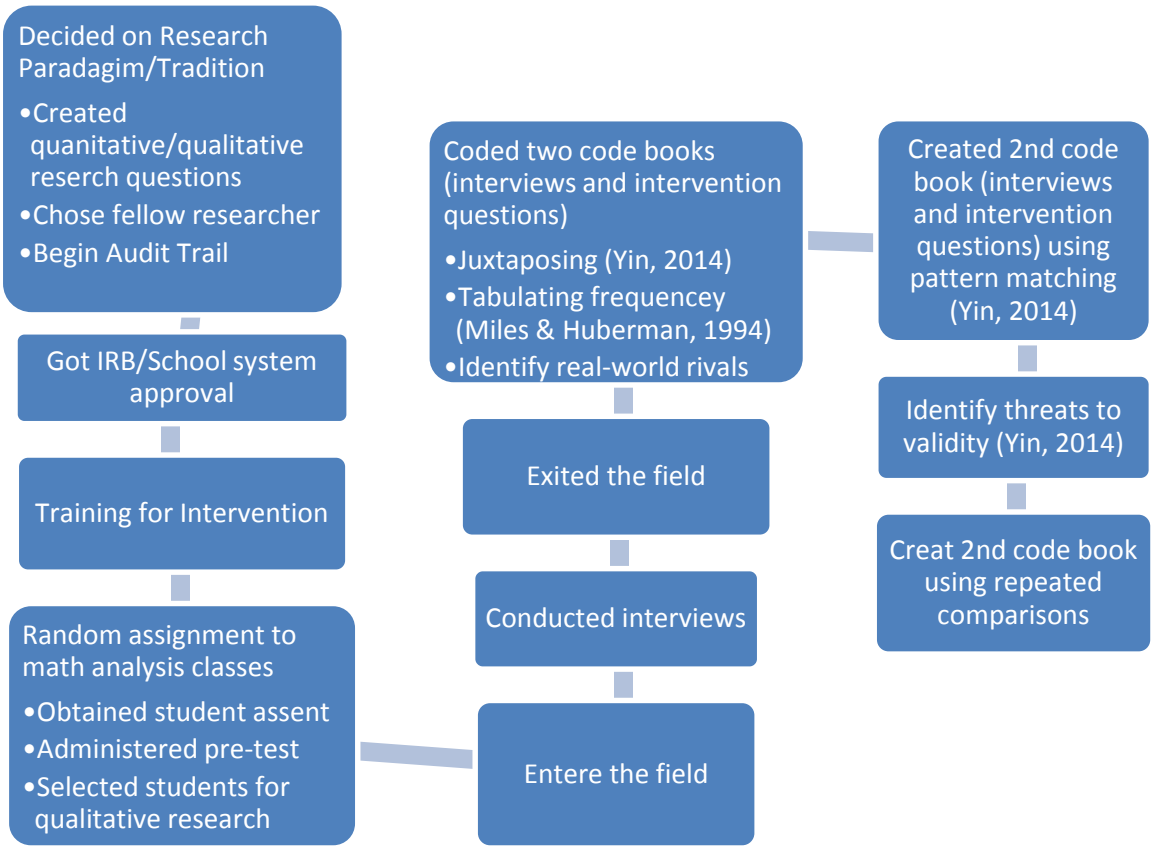

Figure 3. The process for the study's mixed-method research.

Quantitative procedure

Due to the fact that many facets of the study happened simultaneously, the quantitative procedures of the study occurred in several phases. The phases were a precursor to the study's intervals. When the third phase was complete the study began at the 1st Interval (Figure 4).

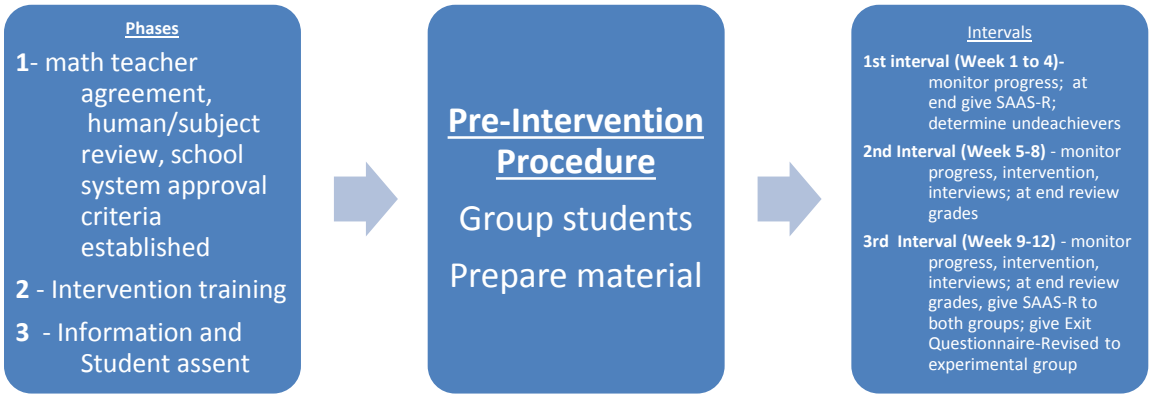

Figure 4. Overview of the study's process.

Phase one. The math analysis teacher agreed to be a part of the study in which she was told that the process was expected to take approximately nine weeks to complete. Her participation was confirmed approximately 4 months before data collection was scheduled to begin. The researcher determined specific criteria for the sample before entering the field (Patton, 2002). The criteria included gifted students enrolled in a math analysis classroom at a high school in a large school system. Math analysis was selected due to the decline in grades across the school system. The particular high school was chosen since the researcher was a teacher there and had ease of access. The Human Subjects Research Committee at the researcher's institution as well as the research review committee within the school division in which the study was conducted reviewed all research methods and materials in order to approve the study.

Phase two. Approximately 3 months before data collection was scheduled to begin, the math analysis and gifted resource teachers administering the intervention were

provided with thorough training and literature on the goal-setting intervention (McCoach, 2012). These training activities are described below.

Training. The math analysis and gifted resource teachers met to view an introductory video that was developed by McCoach (2012) through The National Research Center on the Gifted and Talented (NRC/GT) at the University of Connecticut. The introductory video had Del Siegle, one of the principal investigators, explaining the length of the video and instructions on returning a module review for their study; however, since this study represented a partial replication of the study for which the video was designed, no communication with the University of Connecticut was necessary.

The two teachers viewed the eight modules. The modules' contents were as follows (Goal Valuation, 2011, Retrieved from http://nrcgt.uconn.edu/underachievement_study/goal-valuation/):

1. The first module introduced a video from McCoach explaining the premise of the intervention, the original researchers' explanation of underachievement's causes, and how the intervention responds to those causes.
2. The second module described different strategies to engage students within he classroom. It covered intrinsic value strategy which was designed to increase a student's enjoyment of a task, attainment value strategy which was designed for the student to identify themselves more with school in terms of scholarly behavior, utility value strategy which was designed to show the student how school is useful, rewards which are put in place for reinforcement, and

individual conferences which had the researcher meeting with the student one on one for 10-15 minutes.

3. The third module described achievement values and the research behind this concept.
4. The fourth was an introduction to the modules and provided a checklist to each strategy.
5. The fifth module described the intrinsic value, gave examples and provided strategies to increase the intrinsic value.
6. The sixth gave research on the attainment value and how to increase this in the class.
7. The seventh module discussed as the utility value, gave an example and provided strategies to increase this value in the class.
8. The final module provided research on rewarding students for good performance by giving general guidelines, consequences of a rewarding inappropriately, and an example of how it worked in a class.

The eight modules were viewed by the math analysis and gifted resource teachers. The math analysis teacher implemented strategies in the class using a daily strategy report (Appendix P). The gifted resource teacher held the individual conferences. These conferences will be described in detail later in this chapter.

Phase three. The third phase of the study entailed acquiring student assent. Since finding interventions is the normal job of a gifted resource teacher, only student assent was needed for participation in the study. In accordance with protocol the students were

given a choice whether or not to participate. Students were informed that they could withdraw from the study at any time.

There researcher informed involved parties several times before the study began. This was done by emailing, calling, and sending notes home. This was separated into sub-sections denoting each set of procedures.

Pre-intervention procedures. After approval was secured from both the research institution and the school system, the researcher spoke to parents and guardians about the study at the school's open house. The researcher then went into the math analysis classes to tell the students about the study and distribute the assent forms for participants to sign (Appendix B). If participants and their guardians had further questions, they were invited to an initial meeting to explain the study.

At the class meeting, the researcher discussed the purpose of goal-setting and assured students that all information given was strictly confidential. It was explained to the participants that this confidentiality was assured by securing documents and recording devices in a locked filing cabinet in which only the researcher had a key. Created documents were secured in a file that was password-protected.

In addition the researcher assigned each participant a number for the purpose of anonymity when discussing or creating a written report. A master list of numbers was kept with the documents in the researcher's possession. Though participants are rarely named by number in this document, when they are only the researcher knows the identity. The participants were allowed to ask questions. Once assent had been provided, participants were formally grouped according to the steps described earlier in this chapter, and the intervention began.

At the end of the 1st Interval (Week 4) the control and treatment groups completed the SAAS-R (McCoach & Siegle, 2003) in order to determine attitudes and motivation before treatment. Since the SAAS-R addresses attitudes towards school, teachers, classes, etc. the four weeks leading up to the intervention was ideal. Attitudes could be surveyed after students had time to acclimate to their class and before the intervention began. This high school followed block scheduling. Block scheduling allows the teacher to meet every other day with her classes. The SAAS-R was given to the control group at the beginning of class one day and then given to the experimental group at the beginning of class the next day in order to collect pre-test data concerning attitudes. The paper and pencil assessment took the entire class no longer than ten minutes to complete. Once students were done the researcher collected the forms and then entered them into an excel spreadsheet.

Grades at the end of the 1st Interval were used to identify the underachieving participants within the gifted and non-gifted participant sub-samples. A composite score was created by adding of each participants' total score and dividing that by the overall total of 356 (i.e. Participant 1 earned a total of 274 points during the 1st interval. His score by 356 which gave him a composite score of 80%). This was done for each of the students at the end of the 1st Interval. Underachieving students were identified using the students' composite score after the 1st Interval. A student who received a C, D, or E at the end of the 1st Interval was identified as an underachiever and was grouped accordingly during each of study's analyses.

Weekly intervention procedures. The intervention began during the 2nd Interval of the study. Students were given intrinsic, attainment, and utility value strategies as well

as rewards in class by the math analysis teacher. The gifted resource teacher (researcher) met with each participant in the experimental group to work through the nine goal-setting sessions. Each goal-setting session lasted approximately 10 minutes during which student answers were recorded using established documentation (Appendices E-M).

During week one, the students identified their interests and how they felt about themselves as learners. This week was a chance for the researcher to get to know the participant (See Appendix E). The second week of conferences had the student identifying their feelings about the class and how they could put forth effort if they were not producing to their satisfaction. They also began to explore the intrinsic, utility, and attainment values (See Appendix F). During the third week, the students learned about interest, utility, and identity values. They also suggested ways to increase those values in the math analysis class (See Appendix G). At week four, the students evaluated whether they could put any of the values in place and what excuses stopped them from being successful in school (See Appendix H). Week five had students identifying short and long term goals and making a plan with checkpoint dates for those goals to be accomplished. Students discussed what could be done in class and what needed to be worked on at home. Students also discussed how they could keep from having roadblocks (See Appendix I). During week six, the student listed goals they had beyond high school and then they made connections to how the class would help them achieve that goal (See Appendix J). Week seven had the students defining and listing causes of underachievement (See Appendix K). Weeks eight and nine had students rating their school-week on a scale from 1-10 and explaining the reasoning for the rating, how they felt they were doing in the class, and any modifications they would make toward their

learning (See Appendices L & M). At the end of the nine-week intervention, each participant had been in goal-setting sessions for a total of 90 minutes.

A composite score was created by adding of each participants' total score and dividing that by the overall total of 356 (i.e. Participant 1 earned a total of 274 points during the 1st interval. His score by 356 which gave him a composite score of 80%). This was done for each of the students at the end of the 1st Interval. Underachieving students were identified using the students' composite score after the 1st Interval. A student who received a C, D, or E at the end of the 1st Interval was identified as an underachiever and was grouped accordingly during each of study's analyses.

For the qualitative component of the study, the researcher met with students assigned to a study block, once a week, in order to ask clarifying questions that pertained to their feelings about a goal-setting intervention. The students and the researchers met for a total of nine weeks. Question topics included, but were not limited to, interest, self-assessment, short and long term goals, values, accomplishments and improvements (Appendix D). The researcher used a digital recorder to capture students' responses to questions that were posed in these 10-minute sessions conducted during their study block. These sessions took place at a private location in the researcher's classroom within the school building. Before recording the sessions, participants were informed that the interview was taped for accurate transcription. All data were locked in a closet to which only the researcher had a key.

Member checking occurred by sharing notes with the participants in order for them to acknowledge that the transcription was an accurate account of the interview. Member checking happened at the beginning of each intervention meeting. This process

occurred at the beginning of each session. The researcher would show the participant the transcript in order to make sure correct data was captured correctly. At the end of each session the researcher thanked the participants for their time

Post-intervention procedures. Grades were checked at the end of the 2nd Interval and then again at the end of the 3rd Interval, which was the end of the intervention time period. Students in both the experimental and control groups completed the SAAS-R at the end of the 3rd Interval. The control group took the SAAS-R at the beginning of class one day and the experimental group took the SAAS-R at the beginning of class the next day.

Additionally the experimental group completed the *Exit Questionnaire—Revised* to determine their beliefs/opinions about the goal-setting program they had completed. Only the experimental group completed this questionnaire since it dealt directly with the intervention. The questionnaire was given to the group as a whole during their lunch block. The lunch block was chosen since that is a time in the day where all students in the experimental group are together.

Follow-up procedures. After data collection concluded, data were analyzed according to the procedures outlined in the Data Analysis section this paper. This analysis process occurred during the 2 months between the second progress report and the beginning of the third marking period.

Data Analysis

Data were organized in a way that was easy to analyze and understand, relating to the research questions and using inferential statistics. Because the design of the proposed project allowed for simple comparisons between the two participating groups of students,

the analyses needed in order to compare such demographically similar students are basic and straightforward. Since the data resulting from the grading, SAAS-R, and Goal Setting Exit Questionnaire-Revised instruments were ordinal, interval, or scale, a series of *t*-tests were used to determine if analyses of variance (ANOVA's) or analyses of covariance (ANCOVA's) were to be implemented in order to identify post-intervention differences between the control and experimental group students. If ANCOVAs were used, data were analyzed to covary for pre-intervention scores and attitudes/beliefs in order to control for pre-intervention differences between participants. Since multiple hypotheses are to be tested, a Bonferroni adjustment to the significance level may be appropriate if several significant results are found.

Qualitative data were collected through the interviews that took place with the students. Interviews were conducted and transcribed on a weekly basis. After each transcription the researcher cut the remarks into strips. These strips were grouped in order to create categories. This process happened throughout the nine weeks. Remarks were added and rearranged as necessary. This began the process of pattern matching. Pattern matching was used for the coding process. Pattern matching is one of the most alluring techniques that are used to code data (Yin, 2014). Coding began at the sentence level. Based on findings, from patterns that were formed, a codebook was created to serve as a framework for coding future transcripts. Each week, open coding happened in order to compare new codes to those derived from previous weeks in order to eventually arrive at themes and create a synthesized codebook (Hays & Singh, 2012). As Hays & Singh also point out (2012), "An important component of developing a strong codebook is constant comparison" (pg. 303). This process of constant comparison continued for all interviews

and codebooks were revised as necessary. The process for creating a codebook came from the interview themselves. Transcripts were printed, cut, and categorized over and over in order to create the many codes used in research. The development of many codebooks were important for triangulation (Hays & Singh, 2012).

The researcher then created thematic concepts and categories across the data sets for all interviews. During this process, the researcher examined the first week of interviews to make sure there was accuracy in coding. In order to establish this accuracy, the final codebook and its codes were able to be applied to the first interview. The final codes and codebook were shared with the math analysis teacher in order to consult with a peer (Patton, 2002). The math analysis teacher checked codes and challenged the findings of the researcher by suggesting other codes or possible explanations. This exercise of peer debriefing added trustworthiness to the findings of the qualitative data (Hays & Singh, 2012).

Data Cleaning

Both quantitative and qualitative data needed to be cleaned. The decisions that were used to prepare the data for analysis are described below.

Quantitative data cleaning. Academic performance was evaluated at the end of the 1st, 2nd, and 3rd intervals. Each interval had a total number of points that students could earn. In order to create a composite grade for each of the three grading periods, assignments were added together and then divided by the total number of points the student could earn for that grading period. This was completed at each of the intervals: 1) the 1st interval which was the baseline data (data between Weeks 1-4); 2) the 2nd interval which was the mid-point data (data between Weeks 5-8); and 3) the 3rd interval which

was the post-intervention data (data between Weeks 9-12). During the 1st and 3rd interval quantitative data needed to be cleaned. This is described below.

During the 1st Interval some students presented a ten point homework assignment. When grades were evaluated at the end of the 1st Interval some students had the ten points and others did not. These ten points were left out of the composite score taken at the end of the 1st Interval since not all participants had completed this assignment. By the end of the 2nd Interval, all participants had completed the assignment. This grade was then included in the calculation at the end of the 2nd Interval.

By the end of the 1st Interval students took four pre-requisite quizzes based on their summer assignment. The last pre-requisite quiz counted for all participants; however, participants could make the decision whether to keep the first three as a part of their grade. Since not all students did not either keep or expunge the grade, only the Prereq4 score was calculated in the composite score at the end of the 1st Interval.

During the 2nd Interval the teacher told the participants they would be having a series of quizzes leading up to the final test. She also let the participants know that if they scored 80% or above on their final test they had the choice to expunge the quizzes leading up to the test. Though everyone was given the chance to do this not everyone scored above an 80% on their final test. Since everyone did not have an equal chance of dropping their quiz grades after they took the final test these quiz grades were not included at the end of the 3rd Interval. There was also a homework presentation grade assigned at the beginning of the 3rd Interval. At the end of the 3rd Interval not all participants had completed this assignment and therefore it was not included in the composite score calculated at the end of the 3rd Interval.

Sub-scale scores were also calculated for the SAAS-R data. Each of the five attitudes sub-scales was measured by certain questions in the survey which measured five sub-scales: 1) questions 2, 3, 5, 11, 13, 20, and 22 addressed academic self-perception; 2) questions 1, 9, 14, 16, 17, 31, and 34 addressed attitudes towards teachers and classes; 3) questions 6, 7, 12, 19, and 23 addressed attitudes towards school; 4) questions 15, 18, 21, 25, 28, and 29 addressed goal valuation; and 5) questions 4, 8, 10, 24, 26, 27, 30, 32, 33, and 35 addressed motivation and self-regulation. Students answered each question on a Likert-type scale from 1-7. To get a composite score for each section, the average score was calculated for each sub-scale.

Qualitative data cleaning. Qualitative data needed to be addressed in order to have data that were easily understood and addressed. The qualitative data question was: In what ways do participating students value a goal setting intervention as it relates to a higher level mathematics course? According to Yin (2014) questions for case studies need to remind the researcher of the information that needs to be collected. Each interview question was created in order to collect the necessary information to address the research question.

Intervention conference worksheets (Appendices E-M) were used to assist students during the study. These documents were relevant to the case study since they supported answering the qualitative question of the research (Yin, 2014). The researcher analyzed answers from the 2nd and 3rd Intervals in order to address qualitative inquiry. A compilation of the questions, taken from the intervention worksheets, is included in the Appendix (Appendix Z). The researcher felt these questions were the best to help support the answer to the qualitative question (Yin, 2012).

CHAPTER IV: RESULTS

The purpose of this study was to answer the following research questions: 1) How underachieving gifted high school students compare to their non-participating peers in overall academic attitudes after receiving a goal valuation intervention; 2) How underachieving gifted high school students compare to their non-participating peers in overall academic performance after receiving a goal valuation intervention; 3) How underachieving non-gifted high school students compare to their non-participating peers in overall academic attitudes after receiving a goal valuation intervention; and 4) How underachieving non-gifted high school students compare to their non-participating peers in overall academic performance after receiving a Goal Valuation intervention. These four questions were answered using quantitative data. Attitudes were measured by the School Attitude Assessment Survey–Revised (SAAS-R); (McCoach & Siegle, 2003). Academic performance data were measured by using grades derived from the participating students' in the Math Analysis courses at three different intervals (1st Interval - 4 weeks into course work, 2nd Interval - 8 weeks into course work and 3rd Interval - 12 weeks into course work – Figure 2). Further data was measured using the Exit Questionnaire-Revised (Sivaraman, 2012). This instrument provided quantitative data to gauge students' opinions of the intervention and to determine whether having positive opinions about the intervention and goal-setting, in general, can be associated with any change in students' actual academic performance.

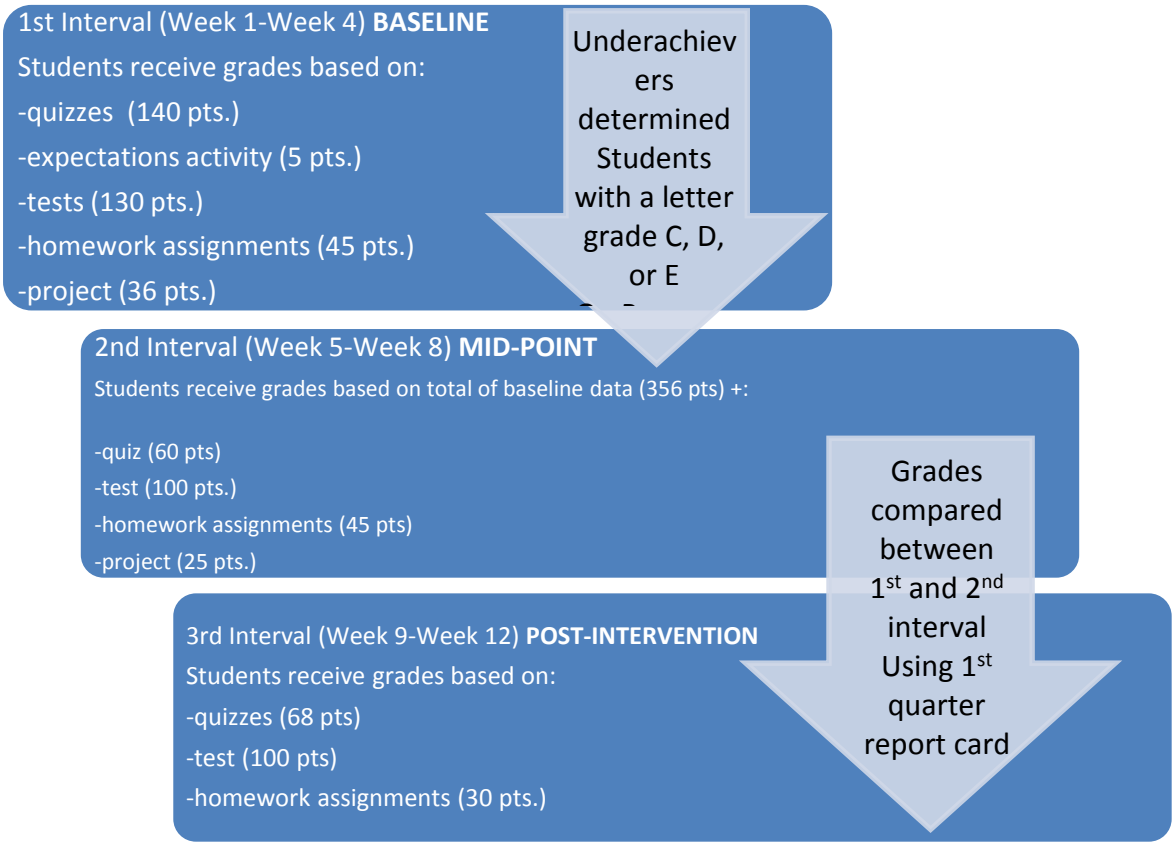

Figure 2. Intervals of quantitative data collection

Qualitative data were collected in order to answer the ways in which students value a goal-setting intervention. This data collection occurred during one-on-one interviews as well as responses students gave on worksheets tied to the intervention.

Results are organized by data source. The first section includes results associated with students' academic performance which were assessed using grades from the 1st, 2nd, and 3rd intervals; the second section includes results associated with student academic attitudes which were measured using the SAAS-R. The third section includes results from the Exit Questionnaire-Revised, and the fourth section includes results from one on one interviews as well as participants' responses to questions on intervention worksheets.

Student academic performance was assessed at three different intervals (See Figure 2). The first interval (baseline data) consisted of 1st quarter marking period progress report grades which were calculated from items graded from weeks 1-4 of the semester. During the 1st Interval students received grades on three quizzes, an expectations activity, two tests, four homework assignments and a project. A total of 356 points were available at the end of the 1st Interval. A composite score was created by adding of each participants' total score and dividing that by the overall total of 356 (i.e. Participant 1 earned a total of 274 points during the 1st interval. His score divided by 356 gave him a composite score of 80%). This was done for each of the students at the end of the 1st Interval. Underachieving students were identified using the students' composite score after the 1st Interval. A student who received a C, D, or E at the end of the 1st Interval was identified as an underachiever and was grouped accordingly during each of study's analyses.

The 2nd Interval consisted of all the grades acquired during the 1st quarter marking period (Weeks 1-8). Additional scores earned during the 2nd Interval were added to the 1st interval in order to gain the second composite score. These composite scores were calculated in the same manner as described previously but with the total score of 586. During the 2nd Interval, students received additional grades on a quiz, a test, four homework assignments, and a project.

The 3rd Interval consisted of 2nd quarter marking period progress report grades (Weeks 9-12). Students received grades on five quizzes, a test, and four homework assignments. A total of 198 points were available during the third interval, and an average composite score was calculated as described previously.

The academic data were used to analyze two of the research questions: 1) How do underachieving gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of actual academic performance? and 2) How do underachieving non-gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of actual academic performance.

Overall academic attitudes were measured using the School Attitude Assessment Survey-Revised (SAAS-R) (McCoach, 2002). . This survey was administered to all study participants preceding the intervention and then again after the intervention. Analyses performed with data derived from the SAAS-R looked at the following research questions: 1) How do underachieving gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of overall academic attitudes? and 2) How do underachieving non-gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of overall academic attitudes?

Each SAAS-R item used a 7-point Likert-type scale format (See Table 1). Student academic attitudes were measured using variables associated with five subscales of the SAAS-R (Motivation and Self-Regulation, Academic Self-Perception, Attitudes Towards Teachers and Classes, Goal Valuation, and Attitudes Towards School) derived from the participating students at the end of the 1st Interval and then again at the end of the 3rd interval. Composite variables were created for each of the five subscales by calculating the mean subscale to give each participant their score in a certain subscale. For example, Participant 1 had the following scores for the subscale of Academic Self-Perception; 6, 4,

7, 6, 3, 5, 6. The mean score for these variables was 5.29 which was this participant's composite score for the Academic Self-Perception subscale. This was done for all the participants at the end of the 1st Interval for a pre-test score and then again at the end of the 3rd Interval for a post-test score.

Table 4

Example of SAAS-R Instrument

Item Example	**Strongly disagree**	**Disagree**	**Slightly disagree**	**Neither agree or disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
I am smart in school							
I am capable of getting straight As.							

The third and final group of quantitative data included student responses to the Exit Questionnaire-Revised which consisted of ten items with 7-point Likert-type scale response options. Only the participants in the experimental group completed this questionnaire at the end of the intervention. Analyses performed with the resulting data yielded results that answered the following research question: In what ways do participating students value a goal setting intervention as it relates to a higher level mathematics course?

Chapter Overview

The chapter will first present results from analyses designed to compare subgroups of participants in terms of academic performance. In each comparison, one subgroup included students who received the intervention, while the other subgroup included students from the control group. Subgroups were compared according to their achievement three times—at the end of the 1st Interval, at the end of the 2nd Interval, and at the end of the 3rd Interval. The following subgroups were compared: 1) entire experimental and control groups, 2) gifted students, 3) gifted underachievers, 4) gifted achievers, 5) non-gifted students, 6) non-gifted underachievers, and 7) non-gifted achievers.

Next, the chapter will present results from analyses designed to compare subgroups of participants in terms of academic attitudes on five subscales—Motivation and Self-Regulation, Academic Self-Perception, Attitudes Towards Teachers and Classes, Goal Valuation, and Attitudes Towards School. In each comparison, one subgroup will include students who received the intervention, while the other subgroup will include students from the control group. The attitudes of the following subgroups will be compared: 1) entire experimental and control groups; 2) gifted students; 3) gifted underachievers; 4) gifted achievers; 5) non-gifted achievers; 6) non-gifted underachievers; and 7) non-gifted achievers.

The Exit Questionnaire will be discussed next. This questionnaire was only given to students who participated in the goal setting intervention. Results shared gives evidence of how students felt about a goal valuation intervention.

Finally qualitative data will be shared from the one on one interviews as well as answers from intervention worksheets.

Academic Performance Analyses

Student academic performance was measured using grades derived from the participating students in the Math Analysis courses at three different intervals (See Figure 2). Composite variables derived from student average scores on the assignments graded within each of the intervals served as the bases for subgroup comparisons.

Table 5

Academic Performance Descriptive Statistics

	Overall			Experimental			Control		
	M	SD	n	M	SD	n	M	SD	n
1st Interval	.82	.11	48	.81	.12	22	.83	.11	26
2nd Interval	.79	.12	48	.77	.11	22	.81	.12	26
3rd Interval	.81	.11	48	.79	.11	22	.83	.11	26

The average grade before the intervention (1st Interval) for the overall group was .82. The baseline mean score for the experimental group was slightly lower at .81 and the baseline mean score for the control group was slightly higher at .83. At the midpoint of the intervention (2nd Interval), the control group again had the highest average grade with a mean score of .81 compared to the overall mean score of .79 and the experimental group mean score of .77. Similarly, after the intervention (3rd Interval) the control group still had the highest mean score at .83 compared to the overage mean score of .81 and the experimental group score at .79. These averages describe how the control group not only

started off with a higher average academic performance, but maintained it throughout the study.

Overall comparisons. The researcher sought to determine whether statistically significant differences existed at the 2nd Interval and 3rd Interval between the control and experimental groups. Grades at the 1st Interval are a potential covariate to the 2nd Interval and should have been included as a covariate in the model if there were significant differences between the control group and experimental groups' baseline grades. Also, the 2nd Interval grades are a potential covariate to the 3rd Interval and were included in the model if there were statistically significant differences between the groups' midpoint grades.

T-tests were conducted to determine whether statistically significant differences existed between the control and the experimental groups at the beginning of the intervention with baseline data (1st Interval) and at the midpoint of the intervention with the 2nd Interval data (Table 6). As previously specified, if significant differences were not identified, an ANOVA would be sufficient to analyze the data. If statistically significant differences were identified, an ANCOVA should be used. Levene's tests were also conducted to determine whether the variances for each interval of grades (1st, 2nd, and 3rd) were homogenous. This assumption is necessary in order to trust the results of the *t*-tests and ANOVA or ANCOVA.

Table 6 contains the results of the *t*-test used to compare the control group and experimental group baseline grades (1st Interval). The results of the Levene's test found that the assumption of homogeneous variances was met for 1st Interval academic achievement (p=.340).

Table 6

Results of t-test and Descriptive Statistics for 1st Interval Academic Performance for Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
1st Interval	.82	.09	22	.83	.07	26	-.039, .054	.316	46	.754

Because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance at the 2nd Interval, for the experimental versus control groups (See Table 7). The results of the Levene's test found that the assumption of homogeneous variances was met for 2nd Interval academic achievement (p=.934). There was no statistically significant difference between the two groups' academic performance at the $\alpha = .05$ level [$F(1,46) = .556$, $p = .460$].

Table 7

One-Way Analysis of Variance for 2nd Interval for Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.007	.007	.556	.460
Within groups	46	.572	.012		
Total	47	.579			

Table 8 contains the results of the *t*-test used to compare the control group and experimental group midpoint grades (2nd Interval).

Table 8.

Results of t-test and Descriptive Statistics for 2nd Interval Academic Performance for Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
2nd Interval	.81	.12	22	.83	.11	26	-.041, .089	.746	46	.460

Again, because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance, during the 3rd Interval for all participants (See Table 9). The results of the Levene's test found that the assumption of homogeneous variances was met for 3rd Interval academic achievement (p=.848). There was no statistically significant effect of the intervention on the 3rd Interval academic performance at the $\alpha = .05$ level for all participants in the control and experimental groups [$F(1,46) = 1.77$, p=.190].

Table 9.

One-Way Analysis of Variance for 3rd Interval Academic Performance for Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.025	.025	1.771	.190
Within groups	46	.661	.014		
Total	47	.686			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on total-intervention academic performance, between the 2nd and 3rd Interval for all participants (See Table 10). The results of the Levene's test found that the assumption of homogeneous variances was met for academic performance between the 2nd and 3rd Interval (p=.935). There was no significant effect of the intervention between 2nd and 3rd Interval academic performance $\alpha = .05$ level for all participants in the control and experimental groups [$F(1,46) = 1.17$, p=.284].

Table 10.

One-Way Analysis of Variance for Academic Performance Between 2nd and 3rd Interval for Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.014	.014	1.175	.284

Within groups	46	.549	.012
Total	47	.563	

Gifted student comparisons. *t*-tests were conducted to determine whether statistically significant differences existed between gifted students in the control group and gifted students in the experimental group at the beginning of the intervention with baseline data (1st Interval) and at the midpoint of the intervention with the 2nd Interval (Table 11). As previously specified, if significant differences were not identified, an ANOVA would be sufficient to analyze midpoint academic data. If statistically significant differences were identified, an ANCOVA was used. Levene's tests were also conducted to determine whether the variances for each interval of grades (1st, 2nd, and 3rd) were homogenous between the control group and the experimental group. The results of the Levene's tests indicated that the requirement of homogeneous variances was met. This assumption is necessary in order to trust the results of the *t*-tests and ANOVA or ANCOVA.

Table 11 contains the results of the *t*-test for comparing the control gifted group and experimental gifted group baseline grades (1st Interval). The results of the Levene's test found that the assumption of homogeneous variances was met for 1st Interval gifted student academic achievement (p=.265).

Table 11

Results of t-test and Descriptive Statistics for 1st Interval Academic Performance for Gifted Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
1st Interval	.84	.10	11	.81	.07	17	-.086, .041	-.731	26	.472

Because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance at the 2nd Interval, for the experimental versus control gifted groups (See Table 12). The results of the Levene's test found that the assumption of homogeneous variances was met for 2nd Interval gifted student academic achievement (p=.726). There was no significant effect of the intervention on academic performance at the $\alpha = .05$ level during the 2nd Interval for gifted participants in the control and experimental groups [$F(1,26) = .345$, p=.562].

Table 12

One-Way Analysis of Variance for 2nd Interval for Control and Experimental Gifted Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.005	.005	.345	.562
Within groups	26	.380	.015		

Total	27	.385

Table 13 contains the results of the *t*-test for comparing the gifted control group and gifted experimental group midpoint grades (2nd Interval).

Table 13

Results of t-test and Descriptive Statistics for 2nd Interval Academic Performance for Gifted Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
2nd Interval	.83	.13	11	.80	.11	17	-.123, .068	-.587	26	.562

Again, because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance, during the 3rd Interval for gifted participants (See Table 14). The results of the Levene's test found that the assumption of homogeneous variances was met for 3rd Interval gifted student academic achievement (p=.584). There was no significant effect of the intervention on the 3rd Interval academic performance at the $\alpha = .05$ level for gifted participants in the control and experimental groups [$F(1,26) = .148$, p=.704].

Table 14

One-Way Analysis of Variance for 3rd Interval Academic Performance for Gifted Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.002	.002	.148	.704
Within groups	26	.424	.016		
Total	27	.642			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on total-intervention academic performance, between the 2nd and 3rd Interval for gifted control and experimental groups (See Table 15). The results of the Levene's test found that the assumption of homogeneous variances was met for academic performance between the 2nd and 3rd Interval for gifted students (p=.927). There was no significant effect of the intervention between the 2nd and 3rd Interval's academic performance at the p<.05 level for gifted participants in the control and experimental groups [F(1,26) = .269, p=.609].

Table 15

One-Way Analysis of Variance between 2nd and 3rd Intervals Academic Performance for Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.004	.004	.269	.609
Within groups	26	.358	.014		
Total	27	.362			

Gifted, underachieving student comparisons. *t*-tests were conducted to determine whether statistically significant differences existed between the control gifted, underachieving group and the experimental gifted, underachieving group at the beginning of the intervention with baseline data (1st Interval) and at the midpoint of the intervention with the 2nd Interval (Table 16). As previously specified, if statistically significant differences were not identified, an ANOVA would be sufficient to analyze the data. If statistically significant differences were identified, an ANCOVA should be used. Levene's tests were also conducted to determine whether the variances for each interval of grades (1st, 2nd, and 3rd) were homogenous between the control group and the experimental group. The results of the Levene's tests found that the requirement of homogeneous variances was met. This assumption is necessary in order to trust the results of the *t*-tests and ANOVA or ANCOVA.

Table 16 contains the results of the *t*-test for comparing the control gifted group and experimental gifted group baseline grades (1st Interval). The results of the Levene's

test found that the assumption of homogeneous variances was met for 1st Interval gifted, underachieving student academic achievement (p=.214).

Table 16

Results of t-test and Descriptive Statistics for 1st Interval Academic Performance for Gifted Underachiever Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
1st Interval	.73	.07	3	.75	.04	7	-.057, .104	.664	8	.525

Because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance at the 2nd Interval, for the experimental versus control gifted, underachieving groups (See Table 17). The results of the Levene's test found that the assumption of homogeneous variances was met for 2nd Interval gifted, underachieving student academic achievement (p=.198). There was no significant effect of the intervention on academic performance at the $\alpha = .05$ level at the 2nd Interval for gifted underachievers in the control and experimental groups [$F(1,8) = .335$, p=.579].

Table 17

One-Way Analysis of Variance for 2nd Interval Academic Performance for Gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.004	.004	.335	.579
Within groups	8	.105	.013		
Total	9	.109			

Table 18 contains the results of the *t*-test for comparing the gifted, underachieving control group and gifted, underachieving experimental group midpoint grades (2nd Interval).

Table 18

Results of t-test and Descriptive Statistics for 2nd Interval Academic Performance for Gifted, Underachieving Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
2nd Interval	.78	.17	3	.73	.09	7	-.228, .136	-.579	8	.579

Again, because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance, during the 3rd Interval for gifted,

underachieving participants (See Table 19). The results of the Levene's test found that the assumption of homogeneous variances was met for 3rd Interval gifted, underachieving student academic achievement (p=.843). There was no significant effect of the intervention on academic performance at the $\alpha = .05$ level at the 3rd Interval for gifted underachievers in the control and experimental groups [$F(1,8) = 2.173$, p=.179].

Table 19

One-Way Analysis of Variance for 3nd Interval Academic Performance for Gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.030	.030	2.173	.179
Within groups	8	.110	.014		
Total	9	.140			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on total-intervention academic performance, between the 2nd and 3rd Interval for gifted, underachieving control and experimental groups (See Table 20). The results of the Levene's test found that the assumption of homogeneous variances was met for academic performance between the 2nd and 3rd Interval for gifted, underachieving students (p=.558). There was no significant effect between the 2nd and 3rd Interval's academic performance at the $\alpha = .05$ level for all underachieving gifted participants in the control and experimental groups [$F(1,8) = 1.094$, p=.326].

Table 20.

One-Way Analysis of Variance between 2nd and 3rd Interval Performance for Gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.013	.013	1.094	.326
Within groups	8	.098	.012		
Total	9	.111			

Gifted, achieving student comparisons. *t*-tests were conducted to determine whether statistically significant differences existed between the control and experimental gifted achievers at the beginning of the intervention with baseline data (1st Interval) and at the midpoint of the intervention with the 2nd Interval. As previously specified, if statistically significant differences were not identified, an ANOVA would be sufficient to analyze the data. If statistically significant differences were identified, an ANCOVA should be used. Levene's tests were also conducted to determine whether the variances for each interval of grades (1st, 2nd, and 3rd) were homogenous between the control group and the experimental group. The results of the Levene's tests found that the requirement of homogeneous variances was met. This assumption is necessary in order to trust the results of the *t*-tests and ANOVA or ANCOVA.

Table 21 contains the results of the *t*-test for comparing the control and experimental gifted achievers' baseline grades (1st Interval). The results of the Levene's

test found that the assumption of homogeneous variances was met for 1st Interval academic performance for gifted, achieving students (p=.163).

Table 21

Results of t-test and Descriptive Statistics for 1st Interval Academic Performance for Control and Experimental Gifted Achievers

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
1st Interval	.88	.07	8	.86	.04	10	-.075, .036	-.733	16	.474

Because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance at the 2nd Interval, for the experimental versus control gifted achievers (See Table 22). The results of the Levene's test found that the assumption of homogeneous variances was met for 2nd Interval academic performance for gifted, achieving students (p=.831).There was no statistically significant difference between the two groups' academic performance at the $\alpha = .05$ level [$F(1,16) = .002$, p=.965].

Table 22

One-Way Analysis of Variance for 2nd Interval for Control and Experimental Gifted Achievers

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.000	.000	.002	.965
Within groups	16	.204	.013		
Total	17	.204			

Table 23 contains the results of the *t*-test for comparing the control and experimental gifted achievers midpoint grades (2nd Interval).

Table 23

Results of t-test and Descriptive Statistics for 2nd Interval Academic Performance for Gifted Achievers Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
2nd Interval	.85	.13	8	.85	.10	10	-.111, .115	.045	16	.965

Again, because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance, during the 3rd Interval for control and experimental gifted achievers (See Table 24). The results of the Levene's test found that

the assumption of homogeneous variances was met for 3rd Interval academic performance for gifted, achieving students (p=.268).There was no statistically significant effect of the intervention on the 3rd Interval academic performance at the α = .05 level for all participants in the control and experimental groups [F(1,16) = 1.14, p=.268].

Table 24

One-Way Analysis of Variance for 3rd Interval Academic Performance for Control and Experimental Gifted Achievers

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.013	.013	1.315	.268
Within groups	16	.164	.010		
Total	17	.177			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on control and experimental gifted achiever academic performance, between the 2nd and 3rd Interval for all participants (See Table 25). The results of the Levene's test found that the assumption of homogeneous variances was met for academic performance between the 2nd and 3rd Interval for gifted, achieving students (p=.368). There was no significant effect of the intervention between 2nd and 3rd Interval academic performance at the α = .05 level for all participants in the control and experimental groups [F(1,16) = .318, p=.580].

Table 25

One-Way Analysis of Variance for Academic Performance between 2nd and 3rd Interval for Control and Experimental Gifted Achievers

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.003	.003	.318	.580
Within groups	16	.160	.010		
Total	17	.163			

Non-gifted student comparisons. *t*-tests were conducted to determine whether statistically significant differences existed between the control non-gifted, underachieving group and the experimental non-gifted, group at the beginning of the intervention with baseline data (1st Interval) and at the midpoint of the intervention with the 2nd Interval. Levene's tests were also conducted to check that the requirement of homogeneous variances was met. As previously specified, if statistically significant differences were not identified, an ANOVA would be sufficient to analyze the data. If statistically significant differences were identified, an ANCOVA should be used.

Table 26 contains the results of the *t*-test for comparing the control non-gifted group and experimental non-gifted group baseline grades (1st Interval). The results of the Levene's test found that the assumption of homogeneous variances was met for 1st Interval academic performance for non-gifted students (p=.553).

Table 26

Results of t-test and Descriptive Statistics for Baseline Academic Performance for Non-Gifted Students in the Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
1st Interval	.80	.08	11	.85	.07	9	-.026, .123	1.35	18	.192

Because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance at the 2nd Interval, for the experimental versus control non-gifted, underachieving groups (See Table 27). The results of the Levene's test found that the assumption of homogeneous variances was met for 2nd Interval academic performance for non-gifted students (p=.213). There was a significant effect of the intervention on academic performance at the $\alpha = .05$ level at the 2nd Interval of the intervention for non-gifted students in the control and experimental groups [$F(1,18) = 7.536$, p=.013].

Table 27

One-Way Analysis of Variance for 2nd Interval Academic Performance for Non-Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.055	.055	7.536	.013

Within groups	18	.131	.007
Total	19	.185	

Table 28 contains the results of the *t*-test for comparing the non-gifted, underachieving control group and gifted, underachieving experimental group midpoint grades (2nd Interval).

Table 28

Results of t-test and Descriptive Statistics for 2nd Interval Academic Performance for Non-Gifted Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
2nd Interval	.79	.10	11	.90	.06	9	.028, .182	2.75	18	.013

Because statistically significant differences were observed in the *t*-test results for the 2nd Interval, a univariate analysis of variance (ANCOVA) was conducted to compare the effect of a goal setting intervention on academic performance at the 3rd Interval after controlling for academic performance at the 2nd Interval for non-gifted students in both the control and experimental groups (See Table 29). The ANCOVA indicated that, after controlling for 2nd Interval academic performance, the observed differences between non-gifted students' academic performance was not statistically significant [$F(1,17) = 3.90$, $p=.065$].

Table 29

Results of t-test and Descriptive Statistics for 3rd Interval Academic Performance for Non-Gifted Control and Experimental Groups

Source	*Type III SS*	*df*	*MS*	*F*	*p*
Corrected Model	.176[a]	2	.088	19.986	.000
Intercept	.007	1	.007	1.625	.219
Mid-Aca Achievement	.070	1	.070	15.754	.001
Group	.017	1	.017	3.903	.065
Error	.075	17	.004		
Total	13.311	20			
Corrected Total	.251	19			

Again, because statistically significant differences were observed in the *t*-test results for the 2nd Interval A univariate analysis of variance (ANCOVA) was conducted to compare the effect of a goal setting intervention on academic performance between the 2nd and 3rd Interval after controlling for academic performance at the 2nd Interval for non-gifted students in both the control and experimental groups (See Table 30). The ANCOVA indicated that, after controlling for 2nd Interval academic performance, the observed differences between non-gifted students' academic performance was not statistically significant [$F(1,17) = 3.90$, $p=.065$].

Table 30

Univariate Analysis of Variance for 2nd and 3rd Interval Academic Performance for Non-Gifted Students in the Control and Experimental Groups

Source	*Type III SS*	*df*	*MS*	*F*	*p*
Corrected Model	.177[a]	2	.088	93.524	.000
Intercept	.002	1	.002	1.625	.219
Mid-Aca Achievement	.100	1	.100	105.862	.000
Group	.004	1	.004	3.903	.065
Error	.016	17	.001		
Total	13.809	20			
Corrected Total	.193	19			

a. R Squared=.702 (Adjusted R Squared = .667)

Non-gifted underachiever comparisons. t-tests were conducted to determine whether statistically significant differences existed between the control non-gifted, underachieving group and the experimental non-gifted, underachieving group at the beginning of the intervention with baseline data (1st Interval) and at the midpoint of the intervention with the 2nd Interval. As previously specified, if significant differences were not identified, an ANOVA would be sufficient to analyze the data. If statistically significant differences were identified, an ANCOVA should be used. Levene's tests could not be used due to the size of the subgroups.

Table 31 contains the results of the *t*-test for comparing the control non-gifted group and experimental non-gifted group baseline grades (1st Interval).

Table 31

Results of t-test and Descriptive Statistics for 1st Interval Academic Performance for Non-Gifted Underachiever Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
1st Interval	.74	.05	6	.69	--	1	-.184, .078	-1.03	5	.348

Because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance at the 2nd Interval, for the experimental versus control non-gifted, underachieving groups (See Table 32). There was no significant effect of the intervention on academic performance at the $\alpha = .05$ level at the 2nd Interval of the intervention for non-gifted underachievers in the control and experimental groups [$F(1,6) = .005$, $p = .948$].

Table 32

One-Way Analysis of Variance for 2nd Interval Academic Performance for Non-Gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.000	.000	.005	.948
Within groups	5	.057	.011		

Total	6	.057

Table 33 contains the results of the *t*-test for comparing the non-gifted, underachieving control group and non-gifted, underachieving experimental group midpoint grades (2nd Interval).

Table 33

Results of t-test and Descriptive Statistics for 2nd Interval Academic Performance for Non-Gifted, Underachieving Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
2nd Interval	.76	.11	6	.77	--	1	-.289, .305	.069	5	.948

Again, because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance, during the 3rd Interval for gifted, underachieving participants (See Table 34). There was no significant effect of the intervention on academic performance at the $\alpha = .05$ level at the 3rdInterval for gifted underachievers in the control and experimental groups [$F(1,6) = 1.936$, $p=.223$].

Table 34

One-Way Analysis of Variance for 3rd Interval Academic Performance for Non-Gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.034	.034	1.936	.223
Within groups	5	.088	.018		
Total	6	.122			

There was no significant effect of the intervention between 2nd and 3rd Interval academic performance at the $\alpha = .05$ level for non-gifted underachievers in the control and experimental groups [$F(1,6) = .596$, p=.475].

Table 35

One-Way Analysis of Variance between 2nd and 3rd Interval Performance for Non-Gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.008	.008	.596	.475
Within groups	5	.067	.013		
Total	6	.075			

Non-gifted, achieving student comparisons. *t*-tests were conducted to determine whether statistically significant differences existed between the control non-gifted, achieving group and the experimental non-gifted, achieving group at the beginning of the intervention with baseline data (1st Interval) and at the midpoint of the intervention with the 2nd Interval. As previously specified, if statistically significant differences were not identified, an ANOVA would be sufficient to analyze the data. If statistically significant differences were identified, an ANCOVA should be used. Levene's tests were conducted to check the requirement of homogeneous variances.

Table 36 contains the results of the *t*-test for comparing the control and experimental non-gifted achiever baseline grades (1st Interval). The results of the Levene's test found that the requirement of homogeneous variances for the 1st Interval was met (p=.637).

Table 36

Results of t-test and Descriptive Statistics for 1st Interval Academic Performance for Non-Gifted Achiever Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
1st Interval	.87	.05	5	.87	.05	8	-.063, .054	-.152	11	.882

Because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance at the 2nd Interval, for the experimental versus control non-gifted, achieving groups (See Table 37). However, Levene's test was

violated for the 2nd Interval and homogeneous variances cannot be assumed (p=.026), therefore the ANOVA results cannot be trusted. The ANOVA showed there was a significant effect of the intervention on academic performance at the $\alpha = .05$ level at the 2nd Interval for non-gifted achievers in the control and experimental groups [$F(1,11) = 5.654$, p=.037].

Table 37

One-Way Analysis of Variance for 2nd Interval Academic Performance for Non-Gifted Achievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.022	.022	5.654	.037
Within groups	11	.042	.004		
Total	12	.064			

Table 38 contains the results of the *t*-test for comparing the non-gifted, achieving control group and gifted, underachieving experimental group midpoint grades (2nd Interval). Levene's test was violated for the 2nd Interval and homogeneous variances cannot be assumed (p=.026), therefore the *t*-test for equal variances not assumed was used.

Table 38

Results of t-test and Descriptive Statistics for 2nd Interval Academic Performance for Non-Gifted, Achieving Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
2nd Interval	.83	.09	5	.91	.04	8	-.023, .191	2.01	5.1	.099

Because statistically significant differences were not observed in the *t*-test results, a one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic performance at the 3rd Interval, for the experimental versus control non-gifted, achieving groups (See Table 39). The results of the Levene's test found that the requirement of homogeneous variances for the 3rd Interval was met (p=.078). There was a significant difference between the academic performance of the control and experimental groups after the intervention (3rd Interval) using a .05 significant level for non-gifted achievers [$F(1,10) = 8.956$, p=.012].

Table 39.

One-Way Analysis of Variance for 3rd Interval Academic Performance for Non-Gifted Achievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.033	.033	8.956	.012
Within groups	5	.040	.004		

Total	6	.073

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on total-intervention academic performance, between the 2nd and 3rd Interval for non-gifted, achieving control and experimental groups (See Table 40). Levene'e test was conducted for academic performance of non-gifted achievers between the 2nd and 3rd Interval and the assumption of homogeneous variances was not met (p=.012), therefore the ANOVA results cannot be trusted. The ANOVA indicated that, there was a significant effect of the intervention between 2nd and 3rd Interval academic performance at the $\alpha = .05$ level for non-gifted achievers in the control and experimental groups [$F(1,6) = 9.506$, p=.010].

Table 40.

One-Way Analysis of Variance for 2nd Interval and 3rd Interval Academic Performance for Non-Gifted Achievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.026	.026	9.506	.010
Within groups	11	.031	.003		
Total	12	.057			

Academic Attitude Analyses. Attitudes were measured by using the School Attitude Assessment Survey-Revised (SAAS-R); (McCoach, 2002). Participants in both the

control and experimental groups were asked to complete the survey at the end of the 1st Interval (i.e., directly before the intervention began) and then again at the end of the 3rd Interval (i.e., after the intervention was concluded). Control group students completed both the pre- and post-survey one day before students in the experimental group. All students completed both questionnaires during the first 10 minutes of their math classes.

The survey was comprised of 35 questions with seven-point Likert-type response options (i.e., *strongly agree, agree, slightly agree, neither agree nor disagree, slightly disagree, disagree*, and *strongly disagree*). The 35 survey questions were grouped into five subscales: Academic Self-Perception, Attitudes Towards Teachers and Classes, Attitudes Toward School, Goal Valuation, and Motivation and Self-Regulation (Figure 2). Instead of comparing each of the 35 survey items individually, comparisons at the control and experimental groups were done at the subscale level. For each student, five mean scores were computed, one for each subscale. *t*-tests were computed to determine if baseline attitudes (1st Interval) should be included as a covariate in the model to test whether group differences in attitudes exist after the intervention. If attitude differences existed at baseline, then an ANCOVA should be used to test for attitude differences after the intervention. If attitude differences did not exist at baseline, then an ANOVA is sufficient to test for attitude differences after the intervention.

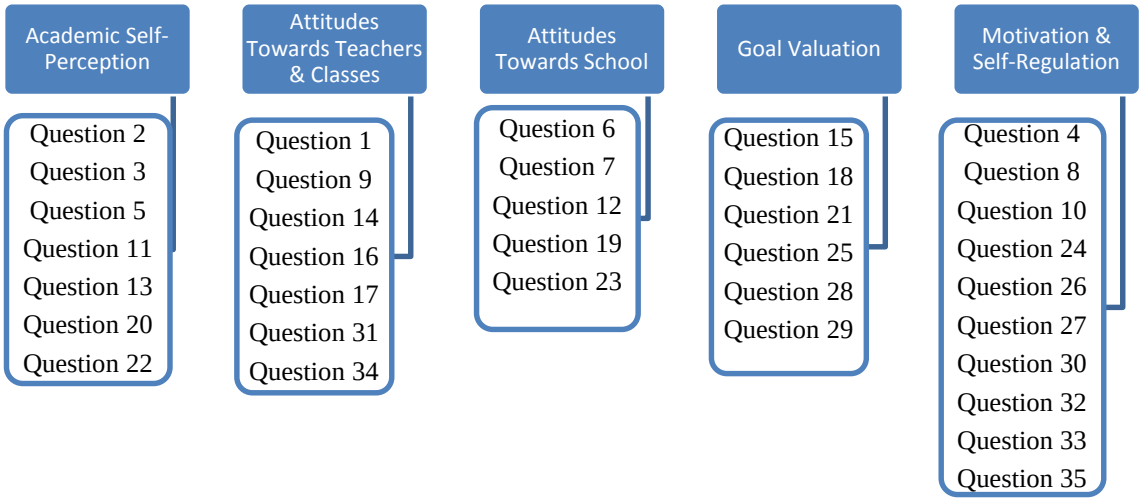

Figure 5. *SAAS-R subscales with questions*

Achievement descriptive statistics. Data about students' attitudes were collected at two intervals. Both the control and experimental groups took the School Attitude Assessment Survey-Revised (SAAS-R) (McCoach, 2002) at the 1st Interval before the intervention began. Each SAAS-R item used a 7-point Likert-type scale format (See Table 1). Student academic attitudes were measured using variables associated with five subscales of the SAAS-R (Motivation and Self-Regulation, Academic Self-Perception, Attitudes Towards Teachers and Classes, Goal Valuation, and Attitudes Towards School) derived from the participating students at the end of the 1st Interval and then again at the end of the 3rd interval. Descriptive statistics for the 1st Interval (pre-test) of these academic attitudes are recorded below on Table 41.

Table 41

Academic Attitudes for Control and Experimental Groups at the 1st Interval (Pre-test)

	Overall			Experimental			Control		
	M	SD	n	M	SD	n	M	SD	n
Academic Self-Perception	5.7	.53	48	5.7	.51	22	5.7	.55	26
Attitudes Towards Teachers and Classes	5.2	.93	48	5.2	.72	22	5.1	1.1	26
Attitudes Toward School	5.3	1.1	48	5.0	1.1	22	5.5	1.1	26
Goal Valuation	6.7	.63	48	6.8	.44	22	6.7	.75	26
Motivation and Self-Regulation	5.6	1.0	48	5.6	.90	22	5.7	1.1	26

Before the intervention began the academic self-perception mean average for the overall group, the control group, and the experimental group were 5.7. Both the overall group and the experimental group had a mean average of 5.2 in Attitudes Towards

Teachers and Classes whereas the mean average for the control group was 5.1. The overall group had a mean average of 5.3 in Attitudes Towards School whereas the experimental group had a mean average of 5.0 and the control group had a mean average of 5.5. Both the overall group and the control group had a mean average of 6.7 in Goal Valuation whereas the mean average for the experimental group was 6.8. Goal valuation had the highest mean average than other attitudes. Both the overall group and the experimental group had a mean average of 5.6 in Motivation and Self-Regulation whereas the mean average for the control group was 5.7.

Data about students' attitudes were collected again after the 3rd Interval (Post-test). Both the control and experimental groups completed the SAAS-R at the conclusion of the intervention. Descriptive statistics for the 3rd Interval (post-test) of these academic attitudes are recorded below on Table 42.

Table 42

Academic Attitudes for Control and Experimental Groups after the 3rd Interval (Post-test)

	Overall			Experimental			Control		
	M	SD	n	M	SD	n	M	SD	n
Academic Self-Perception	5.4	.75	48	5.5	.62	22	5.3	.84	26
Attitudes Towards Teachers and Classes	5.0	.88	48	5.1	.72	22	4.9	1.0	26

Attitudes Toward School	5.2	1.0	48	5.0	1.1	22	5.3	.92	26
Goal Valuation	6.6	.72	48	6.7	.59	22	6.6	.82	26
Motivation and Self-Regulation	5.4	1.1	48	5.3	1.1	22	5.5	1.2	26

When comparing the 1st Interval (Pre-test) mean scores to the 3rd Interval (Post-test) means scores the experimental group means decreased less than the control group means. The mean averages for the experimental group decreased in four of the five subscales; Academic Self-Perception (decrease of .2), Attitudes Towards Teachers and Classes (decrease of .1), Attitudes Towards School (remained the same), Goal Valuation (decrease of .1), and Motivation and Self-Regulation (decrease of .3). The mean averages for the control group decreased in four of the five subscales; Academic Self-Perception (decrease of .4), Attitudes Towards Teachers and Classes (decrease of .2), Attitudes Towards School (decrease of .2), Goal Valuation (decrease of .1), and Motivation and Self-Regulation (decrease of .2). The experimental group averages decreased less than the control group averages for three of the five subscales; Academic Self-Perception, Attitudes Towards Teachers and Classes, and Attitudes Towards School.

Overall comparisons. The researcher sought to determine if student attitude measured by the SAAS-R differed between the treatment and control groups after the intervention using either an ANOVA or an ANCOVA. If student attitudes for the treatment group differed significantly from attitudes of the control group before the

intervention (pre-test), then an ANCOVA should be used to test for differences after the intervention. If student attitudes for the treatment group did not differ significantly from attitudes of the control group before the intervention, then an ANOVA should be used to test for differences after the intervention. Therefore, *t*-tests were conducted in order to determine whether, at the time of pre-test, the treatment group and the control group differed at a statically significant level in terms of their attitudes as measured by the SAAS-R (See Table 43). Levene's test was also conducted to determine whether the assumptions of Equality of Variances were met. This assumption is necessary in order to trust the results of the *t*-tests and subsequent ANOVAs/ANCOVAs. Findings indicated that observed differences between academic attitudes of the treatment and control groups were not statistically significant before the intervention, and pre-test data met the assumptions of the Equality of Variances. As such, ANOVA, as opposed to ANCOVA, procedures were employed to examine subgroups in terms of academic attitudes after the intervention.

Table 43

Results of t-test and Descriptive Statistics for Attitude Subscales for Experimental and Control Group Pre- Intervention

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
MotSR	5.57	.90	22	5.68	1.11	26	-.479, .705	.383	46	.704
AcaSelf	5.70	.51	22	5.66	.553	26	-.352, .268	-.272	46	.787
TeachClass	5.21	.72	22	5.10	1.09	26	-.661, .430	-.425	46	.673

GoalVal	6.77	.44	22	6.67	.753	26	-.466, .269	.539	46	.593
TowSch	5.00	1.06	22	5.51	1.12	26	-.122, 1.15	1.62	46	.110

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on Motivation and Self-Regulation. These data were collected after the intervention (See Table 44). There was no significant effect of the intervention on Motivation and Self-Regulation academic attitudes at the $\alpha = .05$ level for all participants in the control and experimental groups [$F(1,46) = .468$, $p=.497$].

Table 44

One-Way Analysis of Variance for Post-Intervention Motivation and Self-Regulation Academic Attitudes for Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.623	.623	.468	.497
Within groups	46	61.27	1.332		
Total	47	61.89			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Academic Self-Perception. These data were collected at post-intervention (See Table 45). There was no significant effect of the intervention on Academic Self-Perception attitudes at the $\alpha = .05$ level for all participants in the control and experimental groups [$F(1,46) = .742$, $p=.394$].

Table 45

One-Way Analysis of Variance for Post-Intervention Academic Self-Perception Attitudes for Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.416	.416	.742	.394
Within groups	46	25.79	.561		
Total	47	26.20			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Attitudes Towards Teachers and Classes. These data were collected at post-intervention (See Table 46). There was no significant effect of the intervention on academic attitudes towards teacher and classes at the $\alpha = .05$ level for all participants in the control and experimental groups [$F(1,46) = .632$, $p=.431$].

Table 46

One-Way Analysis of Variance for Post-Intervention Academic Attitudes Towards Teacher and Classes for Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.490	.490	.632	.431
Within groups	46	35.67	.775		

Total	47	36.16			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Goal Valuation. These data were collected at post-intervention (See Table 47). There was no significant effect of the intervention on academic attitudes as it relates to Goal Valuation at the $\alpha = .05$ level for all participants in the control and experimental groups [$F(1,46) = .304$, $p=.584$].

Table 47

One-Way Analysis of Variance for Post-Intervention Goal Valuation Academic Attitudes for Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.159	.159	.304	.584
Within groups	46	24.04	.523		
Total	47	24.20			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on participants' academic Attitudes Towards School. These data were collected at post-intervention (See Table 48). There was no significant effect of the intervention on participants' academic Attitudes Towards School at the $\alpha = .05$ level for all participants in the control and experimental groups [$F(1,46) = .947$, $p=.336$].

Table 48

One-Way Analysis of Variance for Post-Intervention Academic Attitudes Towards School for Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.970	.970	.947	.336
Within groups	46	47.11	1.024		
Total	47	48.08			

Gifted student comparisons. The researcher sought to determine if gifted student attitudes measured by the SAAS-R differed between the treatment and control groups after the intervention using either an ANOVA or an ANCOVA. If gifted student attitudes for the treatment group differed significantly from attitudes of the control group before the intervention (pre-test), then an ANCOVA should be used to test for differences after the intervention. If gifted student attitudes for the treatment group did not differ significantly from attitudes of the control group before the intervention, then an ANOVA should be used to test for differences after the intervention. Therefore, *t*-tests were conducted in order to determine whether, at the time of pre-test, the treatment group gifted students and the control group gifted students differed at a statically significant level in terms of their attitudes as measured by the SAAS-R (See Table 49). Levene's test was also conducted to determine whether the assumptions of Equality of Variances were met. This assumption is necessary in order to trust the results of the *t*-tests and subsequent ANOVAs/ANCOVAs. It was found that observed differences between academic attitudes

of the treatment and control groups were not statistically significant for gifted students before the intervention and pre-test data met the assumptions of Equal of Variances. As such, ANOVA, as opposed to ANCOVA, was used to compare the difference in academic attitudes after the intervention.

Table 49

Results of t-test and Descriptive Statistics for Attitude Subscales for Gifted Students in the Experimental and Control Group Pre-Intervention

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
MotSR	5.48	.80	11	5.34	1.10	17	-.935, .642	-.382	26	.706
AcaSelf	5.77	.528	11	5.49	.458	17	-.665, .108	-1.48	26	.150
TeachClass	5.21	.492	11	5.02	.867	17	-.784, .402	-.662	26	.514
GoalVal	6.74	.479	11	6.56	.901	17	-.794, .402	-.619	26	.542
TowSch	5.36	1.04	11	5.40	1.02	17	-.784, .856	.091	26	.928

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Motivation and Self-Regulation. These data were collected at post-intervention (See Table 50). There was no significant effect of the intervention on Motivation and Self-Regulation academic attitudes at the $\alpha = .05$ level for all gifted participants in the control and experimental groups [$F(1,26) = .012$, $p=.915$].

Table 50

One-Way Analysis of Variance for Post-Intervention Motivation and Self-Regulation Academic Attitudes for Gifted Participants in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.017	.017	.012	.915
Within groups	26	38.59	1.48		
Total	27	38.61			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Academic Self-Perception between gifted participants in the control and experimental groups. These data were collected at post-intervention (See Table 51). There was no significant effect of the intervention on Academic Self-Perception attitudes at the $\alpha = .05$ level for all gifted participants in the control and experimental groups [$F(1,26) = .2.71$, p=.11].

Table 51

One-Way Analysis of Variance for Post-Intervention Academic Self-Perception Attitudes for Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	2	1.36	1.36	2.71	.11
Within groups	26	12.98	.50		

Total	27	14.34			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes in gifted students, in both the experimental and control groups as it relates to Attitudes Towards Teachers and Classes. These data were collected at post-intervention (See Table 52). There was no significant effect of the intervention on academic attitudes towards teacher and classes for gifted students in the control and experimental groups at the $\alpha = .05$ level [$F(1,26) = .53$, $p=.48$].

Table 52

One-Way Analysis of Variance for Post-Intervention Academic Attitudes Towards Teacher and Classes for Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.486	.486	.53	.48
Within groups	26	23.94	.921		
Total	27	24.43			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Goal Valuation between gifted participants in the control and experimental groups. These data were collected at post-intervention (See Table 53). There was no significant effect of the intervention on

academic attitudes as it relates to Goal Valuation at the α = .05 level for all gifted participants in the control and experimental groups [$F(1,26) = .24$, p=.63].

Table 53

One-Way Analysis of Variance for Post-Intervention Goal Valuation Academic Attitudes for Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.161	.161	.24	.63
Within groups	26	17.56	.675		
Total	27	17.72			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on gifted participants' academic Attitudes Towards School. These data were collected at post-intervention (See Table 54). There was no significant effect of the intervention on control and experimental gifted participants' academic Attitudes Towards School at the α = .05 level [$F(1,26) = .21$, p=.65].

Table 54

One-Way Analysis of Variance for Post-Intervention Academic Attitudes Towards School for Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.184	.184	.21	.65

Within groups	26	22.86	.879
Total	27	23.044	

Gifted underachiever comparisons. The researcher sought to determine if gifted underachiever student attitudes measured by the SAAS-R differed between the treatment and control groups after the intervention using either an ANOVA or an ANCOVA. If gifted underachiever student attitudes for the treatment group differed significantly from attitudes of the control group before the intervention (pre-test), then an ANCOVA should be used to test for differences after the intervention. If gifted underachiever student attitudes for the treatment group did not differ significantly from attitudes of the control group before the intervention, then an ANOVA should be used to test for differences after the intervention. Therefore, *t*-tests were conducted in order to determine whether, at the time of pre-test, the treatment group for gifted underachieving students and the control group for gifted underachieving students differed at a statically significant level in terms of their attitudes as measured by the SAAS-R (See Table 55). Levene's test was also conducted to determine whether the assumptions of Equality of Variances were met. This assumption is necessary in order to trust the results of the *t*-tests and subsequent ANOVAs/ANCOVAs. It was found that observed differences between academic attitudes of the treatment and control groups were not statistically significant for gifted underachieving students before the intervention and pre-test data met the assumptions of Equal of Variances. As such, ANOVA, as opposed to ANCOVA, was used to compare the difference in academic attitudes after the intervention.

Table 55

Results of t-test and Descriptive Statistics for Attitude Subscales for Underachieving Gifted Students in the Experimental and Control Group Pre- Intervention

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
MotSR	5.30	1.47	3	4.77	1.26	7	-2.62, 1.56	-.582	8	.576
AcaSelf	5.95	.412	3	5.24	.464	7	-1.43, .012	-2.27	8	.053
TeachClass	5.33	.297	3	4.86	1.11	7	-2.02, 1.07	-.712	8	.497
GoalVal	6.44	.822	3	6.26	1.34	7	-2.14, 1.78	-.215	8	.835
TowSch	5.40	.20	3	5.77	.725	7	-.640, 1.38	.847	8	.422

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Motivation and Self-Regulation within underachieving gifted students in the control or experimental groups. These data were collected at post-intervention (See Table 56). There was no significant effect of the intervention on Motivation and Self-Regulation academic attitudes at the $\alpha = .05$ level for underachieving gifted participants in the control and experimental groups [$F(1,8) = .13$, $p=.73$].

Table 56

One-Way Analysis of Variance for Post-Intervention Motivation and Self-Regulation Academic Attitudes for Underachieving Gifted Participants in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.328	.328	.13	.73
Within groups	8	20.98	2.62		
Total	9	21.31			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Academic Self-Perception between underachieving gifted participants in the control and experimental groups. These data were collected at post-intervention (See Table 57). A significant effect of the intervention on Academic Self-Perception attitudes at the $\alpha = .05$ level for underachieving gifted students in the experimental group was found [$F(1,8) = 14.49$, $p=.01$].

Table 57

One-Way Analysis of Variance for Post-Intervention Academic Self-Perception Attitudes for Underachieving Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	5.01	5.01	14.49	.01
Within groups	8	2.77	.346		
Total	9	7.77			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes in underachieving gifted students, in both the experimental and control groups, as it relates to Attitudes Towards Teachers and Classes. These data were collected at post-intervention (See Table 58). There was no significant effect of the intervention on academic attitudes towards teacher and classes for gifted underachieving students in the control and experimental groups at the $\alpha = .05$ level [$F(1,8) = 1.66$, p=.23].

Table 58

One-Way Analysis of Variance for Post-Intervention Academic Attitudes Towards Teacher and Classes for Underachieving Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	1.80	1.80	1.66	.23
Within groups	8	8.64	1.08		
Total	9	10.44			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Goal Valuation between gifted underachivers in the control and experimental groups. These data were collected at post-intervention (See Table 59). There was no significant effect of the intervention on academic attitudes as it relates to Goal Valuation at the $\alpha = .05$ level for all gifted underachieving participants in the control and experimental groups [$F(1,8) = .32$, p=.59].

Table 59

One-Way Analysis of Variance for Post-Intervention Goal Valuation Academic Attitudes for Underachieving Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.492	.492	.32	.59

Within groups	8	12.34	1.54
Total	9	12.84	

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on underachieving gifted participants' academic Attitudes Towards School. These data were collected at post-intervention (See Table 60). There was no significant effect of the intervention on underachieving gifted participants' academic Attitudes Towards School at the $\alpha = .05$ level for all underachieving gifted participants in the control and experimental groups [$F(1,8) = .28$, p=.61].

Table 60

One-Way Analysis of Variance for Post-Intervention Academic Attitudes Towards School for Underachieving Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.247	.247	.28	.61
Within groups	8	7.10	.887		
Total	9	7.34			

Gifted achiever comparisons. The researcher sought to determine if gifted achiever student attitudes measured by the SAAS-R differed between the treatment and control groups after the intervention using either an ANOVA or an ANCOVA. If gifted achiever student attitudes for the treatment group differed significantly from attitudes of

the control group before the intervention (pre-test), then an ANCOVA should be used to test for differences after the intervention. If gifted achiever student attitudes for the treatment group did not differ significantly from attitudes of the control group before the intervention, then an ANOVA should be used to test for differences after the intervention. Therefore, *t*-tests were conducted in order to determine whether, at the time of pre-test, the treatment group for gifted achieving students and the control group for gifted achieving students differed at a statically significant level in terms of their attitudes as measured by the SAAS-R (See Table 61). Levene's test was also conducted to determine whether the assumptions of Equality of Variances were met. This assumption is necessary in order to trust the results of the *t*-tests and subsequent ANOVAs/ANCOVAs. It was found that observed differences between academic attitudes of the treatment and control groups were not statistically significant for gifted achieving students before the intervention and pre-test data met the assumptions of Equal of Variances. As such, ANOVA, as opposed to ANCOVA, was used to compare the difference in academic attitudes after the intervention.

Table 61

Results of t-test and Descriptive Statistics for Attitude Subscales for Achieving Gifted Students in the Experimental and Control Group Pre- Intervention

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
MotSR	5.55	.515	8	5.73	.814	10	-.523,.883	.54	16	.595

AcaSelf	5.70	.574	8	5.66	.388	10	-.520,.442	-.17	16	.865
TeachClass	5.16	.558	8	5.13	.698	10	-.676,.612	-.11	16	.917
GoalVal	6.85	.288	8	6.77	.362	10	-.421,.246	-.56	16	.586
TowSch	5.35	1.24	8	5.14	1.15	10	-1.41,1	-.37	16	.716

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Motivation and Self-Regulation within achieving gifted students in the control or experimental groups. These data were collected at post-intervention (See Table 62). There was no significant effect of the intervention on Motivation and Self-Regulation academic attitudes at the $\alpha = .05$ level for achieving gifted participants in the control and experimental groups [$F(1,16) = .91$, $p=.35$].

Table 62

One-Way Analysis of Variance for Post-Intervention Motivation and Self-Regulation Academic Attitudes for Achieving Gifted Participants in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.514	.514	.91	.35
Within groups	16	9.02	.564		
Total	17	9.54			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Academic Self-Perception between achieving gifted participants in the control and experimental groups. These data were collected at post-intervention (See Table 63). No significant effect of the intervention on Academic Self-Perception attitudes at the $\alpha = .05$ level for achieving gifted students in the experimental group was found [$F(1,16) = .36$, $p=.56$].

Table 63

One-Way Analysis of Variance for Post-Intervention Academic Self-Perception Attitudes for Achieving Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.11	.11	.36	.56
Within groups	16	4.84	.302		
Total	17	4.94			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes in achieving gifted students, in both the experimental and control groups, as it relates to Attitudes Towards Teachers and Classes. These data were collected at post-intervention (See Table 64). There was no significant effect of the intervention on academic attitudes Towards Teacher and Classes for achieving gifted students in the control and experimental groups at the $\alpha = .05$ level for the control and experimental groups [$F(1,16) = .22$, $p=.64$].

Table 64

One-Way Analysis of Variance for Post-Intervention Academic Attitudes Towards Teacher and Classes for Achieving Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.147	.147	.22	.64
Within groups	16	10.52	.657		
Total	17	10.66			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Goal Valuation between gifted achievers in the control and experimental groups. These data were collected at post-intervention (See Table 65). There was no significant effect of the intervention on academic attitudes as it relates to Goal Valuation at the $\alpha = .05$ level for achieving gifted participants in the control and experimental groups [$F(1,16) = .17$, p=.68].

Table 65

One-Way Analysis of Variance for Post-Intervention Goal Valuation Academic Attitudes for Achieving Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.037	.037	.17	.68

Within groups	16	3.50	.218		
Total	17	3.53			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on achieving gifted participants' academic Attitudes Towards School. These data were collected at post-intervention (See Table 66). There was no significant effect of the intervention on achieving gifted participants' academic Attitudes Towards School at the $\alpha = .05$ level for all achieving gifted participants in the control and experimental groups [$F(1,16) = .04$, $p = .84$].

Table 66

One-Way Analysis of Variance for Post-Intervention Academic Attitudes Towards School for Achieving Gifted Students in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.04	.04	.04	.84
Within groups	16	15.65	.978		
Total	17	15.69			

Non-gifted student comparisons. The researcher sought to determine if non-gifted student attitudes measured by the SAAS-R differed between the treatment and control groups after the intervention using either an ANOVA or an ANCOVA. If non-gifted student attitudes for the treatment group differed significantly from attitudes of the

control group before the intervention (pre-test), then an ANCOVA should be used to test for differences after the intervention. If non-gifted student attitudes for the treatment group did not differ significantly from attitudes of the control group before the intervention, then an ANOVA should be used to test for differences after the intervention. Therefore, *t*-tests were conducted in order to determine whether, at the time of pre-test, the treatment group for non-gifted students and the control group for non-gifted students differed at a statically significant level in terms of their attitudes as measured by the SAAS-R (See Table 67). Levene's test was also conducted to determine whether the assumptions of Equality of Variances were met. This assumption is necessary in order to trust the results of the *t*-tests and subsequent ANOVAs/ANCOVAs. It was found that observed differences between academic attitudes of the treatment and control groups were not statistically significant for non-gifted students before the intervention and pre-test data met the assumptions of Equal of Variances. As such, ANOVA, as opposed to ANCOVA, was used to compare the difference in academic attitudes after the intervention.

Table 67

Results of t-test and Descriptive Statistics for Pre-Test Academic Attitudes for Non-Gifted Students in the Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
MotSR	5.65	1.02	11	6.33	.83	9	-.208,.157	1.61	18	.125
AcaSelf	5.64	.50	11	5.98	.60	9	-.167,.862	1.42	18	.173

TeachClass	5.22	.913	11	5.25	1.47	9	-1.09,1.16	.062	18	.951
GoalVal	6.79	.429	11	6.87	.274	9	-.265,.430	.50	18	.624
TowSch	4.64	.99	11	5.73	1.32	9	-.040, 2.234	2.06	14.53	.058

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Motivation and Self-Regulation within non-gifted students in the control or experimental groups. These data were collected at post-intervention (See Table 68). There was no significant effect of the intervention on Motivation and Self-Regulation academic attitudes at the $\alpha = .05$ level for non-gifted participants in the control and experimental groups [$F(1,18) = 3.9$, $p=.06$].

Table 68

One-Way Analysis of Variance for Post-Intervention Motivation and Self-Regulation Academic Attitudes for Non-Gifted Participants in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	3.44	3.44	3.9	.06
Within groups	18	15.94	.886		
Total	19	19.38			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Academic Self-Perception within non-gifted students in the control or experimental groups. These data were collected at post-intervention (See Table 69). There was no significant effect of

Academic Self-Perception within the non-gifted populations at the α = .05 level [$F(1,18) = 1.22$, p=.28].

Table 69

One-Way Analysis of Variance for Post-Intervention Academic Self-Perception for Non-gifted Participants in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.574	.574	1.22	.28
Within groups	18	8.47	.471.		
Total	19	9.05			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes towards teachers and class within non-gifted students in the control or experimental groups. These data were collected at post-intervention (See Table 70). There was no significant effect of academic Attitudes Towards Teachers and Classes within the non-gifted populations at the α = .05 level [$F(1,18) = .0$, p=.96].

Table 70

One-Way Analysis of Variance for Post-Intervention Attitudes Towards Teachers and Classes for Non-gifted Participants in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.00	.00	.00	.96
Within groups	18	10.57	.587		
Total	19	10.57			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on Goal Valuation academic attitudes within non-gifted students in the control and experimental groups. These data were collected at post-intervention (See Table 71). There was no significant effect of Goal Valuation towards teachers and classes within the non-gifted populations at the $\alpha = .05$ level [$F(1,18) = .003$, $p = .96$].

Table 71

One-Way Analysis of Variance for Post-Intervention Goal Valuation Attitudes for Non-gifted Participants in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.001	.001	.003	.96
Within groups	18	5.91	.328		

Total	19	5.91			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic Attitudes Towards School within non-gifted students in the control and experimental groups. These data were collected at post-intervention (See Table 72). There was no significant effect of Goal Valuation towards school attitudes within the non-gifted populations at the $\alpha = .05$ level [$F(1,18) = 4.146$, $p=.057$].

Table 72

One-Way Analysis of Variance for Post-Intervention Attitudes Toward School for Non-gifted Participants in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	4.635	4.635	4.146	.057
Within groups	18	20.123	1.118		
Total	19	24.758			

Non-gifted underachiever comparisons. The researcher sought to determine if non-gifted underachiever student attitudes measured by the SAAS-R differed between the treatment and control groups after the intervention using either an ANOVA or an ANCOVA. If non-gifted underachiever student attitudes for the treatment group differed significantly from attitudes of the control group before the intervention (pre-test), then an

ANCOVA should be used to test for differences after the intervention. If non-gifted underachiever student attitudes for the treatment group did not differ significantly from attitudes of the control group before the intervention, then an ANOVA should be used to test for differences after the intervention. Therefore, *t*-tests were conducted in order to determine whether, at the time of pre-test, the treatment group for non-gifted underachieving students and the control group for non-gifted underachieving students differed at a statically significant level in terms of their attitudes as measured by the SAAS-R (See Table 73). Levene's test was also conducted to determine whether the assumptions of Equality of Variances were met. This assumption is necessary in order to trust the results of the *t*-tests and subsequent ANOVAs/ANCOVAs.

It was found that observed differences between four of the academic attitudes for the treatment and control groups were not statistically significant for non-gifted underachieving students before the intervention. Results of the *t*-tests indicated a statistically significant difference between the non-gifted underachieving control and experimental subgroups in terms of pre-test Attitudes Towards Teachers and Classes. All pre-test attitude data met the assumptions of Equal of Variances for non-gifted underachieving students. As such, ANOVA, as opposed to ANCOVA, was used to compare the difference in academic attitudes after the intervention for Academic Self-Perception, Attitudes Toward School, Goal Valuation, and Motivation and Self-Regulation. And, an ANCOVA was used to compare the difference in academic Attitudes Towards Teachers and Classes for non-gifted underachieving students after the intervention.

Table 73

Results of t-test and Descriptive Statistics for Pre-Test Academic Attitudes for Non-Gifted Underachievers in the Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
MotSR	5.94	.365	5	6.39	.869	8	-.465, 1.36	1.08	11	.753
AcaSelf	5.74	.120	5	6.11	.50	8	-.144, .870	1.58	11	.492
TeachClass	4.49	.824	5	5.39	1.50	8	-.722, 2.54	1.23	11	.008
GoalVal	6.90	.30	5	6.87	.292	8	-.361, .378	.05	11	.855
TowSch	4.40	.49	5	5.70	1.41	8	-.160, 2.76	2.0	11	.439

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Motivation and Self-Regulation within non-gifted underachievers in the control or experimental groups. These data were collected at post-intervention (See Table 74). There was no significant effect of the intervention on Motivation and Self-Regulation academic attitudes at the $\alpha = .05$ level for non-gifted underachievers in the control and experimental groups [$F(1,5) = .02$, $p=.90$].

Table 74

One-Way Analysis of Variance for Post-Intervention Motivation and Self-Regulation Academic Attitudes for Non-Gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.034	.034	.02	.90
Within groups	5	9.00	1.80		
Total	6	9.03			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Academic Self-Perception within non-gifted underachievers in the control or experimental groups. These data were collected at post-intervention (See Table 75). There was no significant effect of Academic Self-Perception within the non-gifted underachievers at the $\alpha = .05$ level [$F(1,5) = .21$, p=.66].

Table 75

One-Way Analysis of Variance for Post-Intervention Academic Self-Perception for Non-gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.082	.082	.21	.66

Within groups	5	1.94	.390		
Total	6	2.02			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on Goal Valuation academic attitudes within non-gifted underachievers in the control or experimental groups. These data were collected at post-intervention (See Table 76). There was no significant effect of Goal Valuation academic attitudes within the non-gifted underachiever population at the $\alpha = .05$ level [$F(1,5) = .97$, $p=.37$].

Table 76

One-Way Analysis of Variance for Post-Intervention Goal Valuation Attitudes for Non-gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.720	.720	.97	.37
Within groups	5	3.71	.742		
Total	6	4.43			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on Attitudes Towards School within non-gifted underachievers in the control and experimental groups. These data were collected at post-intervention

(See Table 77). There was no significant effect on Attitudes Towards School within the non-gifted underachievers at the α = .05 level [$F(1,5) = .24$, p=.65].

Table 77

One-Way Analysis of Variance for Academic Attitudes Towards School for Non-gifted Underachievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.381	.381	.24	.65
Within groups	5	8.05	1.61		
Total	6	8.434			

A univariate analysis of covariance (ANCOVA) was conducted to compare the effect of a goal setting intervention on academic Attitudes Towards Teachers and Classes within non-gifted underachievers in both the experimental and control groups. (See Table 78). The ANCOVA indicated that, after controlling for differences between the two groups' pre-test Attitudes Towards Teachers and Classes the observed differences between the two groups post Attitudes Towards Teachers and Classes was not statistically significant at the α = .05 level [$F(1,4) = .11$, p=.75].

Table 78

Univariate Analysis of Variance for Academic Attitudes Towards Teachers and Classes for Non-Gifted Underachievers in the Control and Experimental Groups

Source	*Type III SS*	*df*	*MS*	*F*	*p*
Corrected Model	3.17[a]	2	1.585	5.54	.07
Intercept	.014	1	.014	.05	.84
PreTowSch	.436	1	.436	1.53	.28
Group	.033	1	.033	.11	.75
Error	1.15	4	.286		
Total	207.51	7			
Corrected Total	4.315	8			

b. *R* Squared=.735 (Adjusted R Squared = .602)

Non-gifted achiever comparisons. The researcher sought to determine if non-gifted achiever student attitudes measured by the SAAS-R differed between the treatment and control groups after the intervention using either an ANOVA or an ANCOVA. If non-gifted achiever student attitudes for the treatment group differed significantly from attitudes of the control group before the intervention (pre-test), then an ANCOVA should be used to test for differences after the intervention. If non-gifted achiever student attitudes for the treatment group did not differ significantly from attitudes of the control group before the intervention, then an ANOVA should be used to test for differences after the intervention. Therefore, *t*-tests were conducted in order to determine whether, at the time of pre-test, the treatment group for non-gifted achieving students and the control

group for non-gifted achieving students differed at a statically significant level in terms of their attitudes as measured by the SAAS-R (See Table 79). Levene's test was also conducted to determine whether the assumptions of Equality of Variances were met. This assumption is necessary in order to trust the results of the *t*-tests and subsequent ANOVAs/ANCOVAs.

It was found that observed differences between four of the academic attitudes for the treatment and control groups were not statistically significant for non-gifted achieving students before the intervention. Results of the *t*-tests indicated a statistically significant difference between the non-gifted achieving control and experimental subgroups in terms of pre-test Attitudes Towards School. All pre-test attitude data met the assumptions of Equal of Variances for non-gifted achieving students. As such, ANOVA, as opposed to ANCOVA, was used to compare the difference in non-gifted achieving academic attitudes after the intervention for Academic Self-Perception, Attitudes Teachers and Classes, Goal Valuation, and Motivation and Self-Regulation. And, an ANCOVA was used to compare the difference in academic Attitudes Towards School for non-gifted achieving students after the intervention.

Table 79

Results of t-test and Descriptive Statistics for Pre-Test Academic Attitudes for Non-Gifted Achievers in the Control and Experimental Groups

Outcome	Group						95% CI for Mean Difference			
	Experimental			Control						
	M	SD	n	M	SD	n		t	df	*p*
MotSR	5.94	.365	5	6.39	.869	8	-.465,1.36	1.08	11	.304

AcaSelf	5.74	.120	5	6.11	.50	8	-.144,.872	1.58	11	.143
TeachClass	4.49	.824	5	5.40	1.50	8	-.722,2.54	1.23	11	.246
GoalVal	6.90	.30	5	6.88	.292	8	-.360,.378	.050	11	.961
TowSch	4.40	.490	5	5.70	1.41	8	-.159,2.76	1.96	11	.076

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Motivation and Self-Regulation within non-gifted achievers in the control or experimental groups. These data were collected at post-intervention (See Table 80). There was no significant effect of the intervention on Motivation and Self-Regulation academic attitudes at the $\alpha = .05$ level for non-gifted achievers in the control and experimental groups [$F(1,11) = 4.02$, p=.07].

Table 80

One-Way Analysis of Variance for Post-Intervention Motivation and Self-Regulation Academic Attitudes for Achieving Non-Gifted Achievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	1.72	1.72	4.02	.07
Within groups	11	4.70	.427		
Total	12	6.42			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic attitudes as it relates to Academic Self-Perception

within non-gifted achievers in the control or experimental groups. These data were collected at post-intervention (See Table 81). There was no significant effect of Academic Self-Perception within the non-gifted achievers at the $\alpha = .05$ level [$F(1,11) = .65$, $p=.44$].

Table 81

One-Way Analysis of Variance for Post-Intervention Academic Self-Perception for Non-gifted Achievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.347	.347	.65	.44
Within groups	11	5.85	.532		
Total	12	6.20			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on Goal Valuation academic attitudes within non-gifted achievers in the control or experimental groups. These data were collected at post-intervention (See Table 82). There was no significant effect of Goal Valuation academic attitudes within the non-gifted achievers at the $\alpha = .05$ level [$F(1,11) = .03$, $p=.86$].

Table 82

One-Way Analysis of Variance for Post-Intervention Goal Valuation Academic Attitudes for Non-gifted Achievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.002	.002	.03	.86
Within groups	11	.631	.057		
Total	12	.632			

A one-way between subjects ANOVA was conducted to compare the effect of a goal setting intervention on academic Attitudes Towards Teachers and Classes within non-gifted achievers in the control and experimental groups. These data were collected at post-intervention (See Table 83). There was no significant effect of Attitudes Towards Teachers and Classes within the non-gifted achievers at the $\alpha = .05$ level [$F(1,11) = 4.05$, p=.07].

Table 83.

One-Way Analysis of Variance for Post-Intervention Attitudes Towards Teachers and Classes for Non-gifted Achievers in the Control and Experimental Groups

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	1.55	1.55	4.05	.07
Within groups	11	4.23	.384		

Total	12	5.78

A univariate analysis of variance (ANCOVA) was conducted to compare the effect of a goal setting intervention on academic Attitudes Towards School within non-gifted achievers in both the experimental and control groups. (See Table 84). The ANCOVA indicated that, after controlling for differences between the two groups' pretest attitudes toward school (prTowSch), the observed differences between the two groups post attitudes toward school was not statistically significant at the $\alpha = .05$ level [$F(1,10) = .94$, $p=.36$].

Table 84.

Univariate Analysis of Variance for Academic Attitudes Towards School for Non-Gifted Achievers in the Control and Experimental Groups

Source	*Type III SS*	*df*	*MS*	*F*	*p*
Corrected Model	12.763[a]	2	6.381	18.13	.001
Intercept	1.394	1	1.394	3.96	.08
PreTowSch	7.523	1	7.523	21.37	.001
Group	.330	1	.330	.94	.36
Error	3.52	10	.352		
Total	384.64	13			
Corrected Total	16.283	12			

c. *R* Squared=.688 (Adjusted *R* Squared = .651)

Exit Questionnaire Analyses. *The Exit Questionnaire - Revised* (2015) consisted of ten 7-point Likert-type scale statements (1 – *Strongly Disagree*, 2 – *Disagree*, 3 – S*lightly Disagree*, 4 – *Neither Agree nor Disagree*, 5 – *Slightly Agree*, 6 – Agree, 7 – *Strongly Agree*). The experimental group completed a one-page response sheet (see Appendix O) adapted from Sivaraman (2012). Each participant received an identical response sheet to record his or her responses to the same ten questions. See Table 85 for the questions to the *Exit Questionnaire-Revised*

Table 85

Exit Questionnaire Questions

	Statement
Statement 1	I enjoyed this goal setting project.
Statement 2	I will probably set and work toward goals in the future.
Statement 3	I think setting goals is helpful to my future.
Statement 4	Setting academic goals can help me do better in school.
Statement 5	I think a friend would benefit from a goal setting project such as this.
Statement 6	This goal setting project was valuable to me.
Statement 7	I took this project seriously.
Statement 8	I feel this project has helped me with my grades during this nine-week time period.
Statement 9	I completed this project because I had to and did not gain anything from it.
Statement 10	I believe that setting academic goals and breaking them down into smaller sub-goals can help me do better in school.

"Setting academic goals can help me do better in school" (Statement 4) had the highest average followed by "I think setting goals is helpful to my future" (Statement 3), "I will probably set and work toward goals in the future" (Statement 2), and "I feel this project has helped me with my grades during this nine-week time period" (Statement 8). The statement, "I think a friend would benefit from a goal setting project such as this" (Statement 5) received the lowest rating from the positive statements. (See Table 86). "I completed this project because I had to and did not gain anything from it" had the lowest average which was expected because it was the only statement where a high value on the Likert scale is associated with negative feedback on the intervention.

Table 86.

Exit Questionnaire Descriptive Statistics

Statement	*Min*	*Max*	*Mean*	*SD*	*n*
1	3	7	5.55	.91	22
2	3	7	5.73	1.24	22
3	5	7	5.95	.79	22
4	5	7	6.18	.66	22
5	2	7	5.50	1.19	22
6	4	7	5.36	.90	22
7	3	7	5.45	1.22	22
8	2	7	5.73	1.28	22
9	1	5	2.77	1.23	22
10	2	7	5.64	1.14	22

One-hundred percent of students at least slightly agreed that they will probably set and work toward goals in the future and think setting goals is helpful to their future (Statements 3 and 4). Students only strongly disagreed to the statement "I completed this project because I had to and did not gain anything from it." See Table 87 for percentages of the *Exit Questionnaire-Revised.*

Table 87

Exit Questionnaire Percentages

Statement	*Strongly Disagree*	*Disagree*	*Slightly Disagree*	*Neither Agree nor Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1	0%	0%	4.5%	4.5%	31.8%	50%	9.1%
2	0%	0%	9.1%	4.5%	22.7%	31.8%	31.8%
3	0%	0%	0%	0%	31.8%	40.9%	27.3%
4	0%	0%	0%	0%	13.6%	54.5%	31.8%
5	0%	4.5%	0%	13.6%	18.2%	50%	13.6%
6	0%	0%	0%	13.6%	50%	22.7%	13.6%
7	0%	0%	9.1%	9.1%	31.8%	27.3%	22.7%
8	0%	4.5%	4.5%	0%	22.7%	40.9%	27.3%
9	13.6%	31.8%	31.8%	9.1%	13.6%	0%	0%
10	0%	4.5%	0%	4.5%	27.3%	45.5%	18.2%

Specifically, when asked if they enjoyed the goal setting project (Statement 1), less than 10% of the participants either slightly disagreed or neither agreed or disagreed.

More than 90% of the participants agreed that they enjoyed the goal setting project. See Table 87 and Figure 6 for specific details.

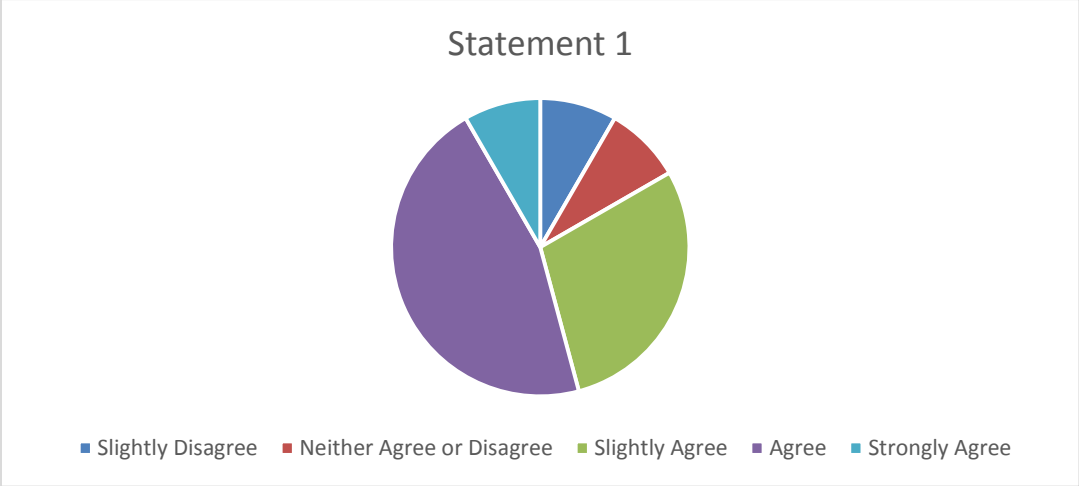

Figure 6. *Responses to the enjoyment of the goal-setting project.*

When participants were asked if they would set goals and work toward them in the future (Statement 2), 9.1% of the participants answered that they would not, whereas 86.3% of the participants identified that they would probably set and work towards goals in the future. Table 87 and Figure 7 illustrate the specific data related to this statement.

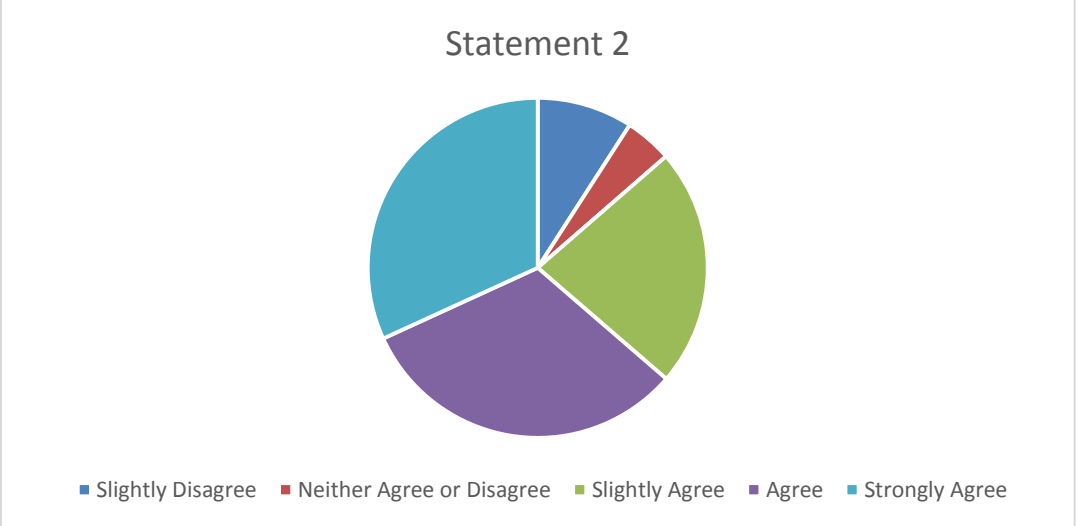

Figure 7. *Responses to setting and working towards goals in the future.*

Two items on the questionnaire (Statements 3 and 4) showed strong positive opinions of goal setting with all participants at least slightly agreeing with the statement. Explicitly, when asked if they thought setting goals was helpful to their future (Statement 3), all the participants agreed in some way with this statement. Over 67% of the participants agreed that goal-setting will be helping to their future. See Table 87 and Figure 8 for the complete analysis of this statement.

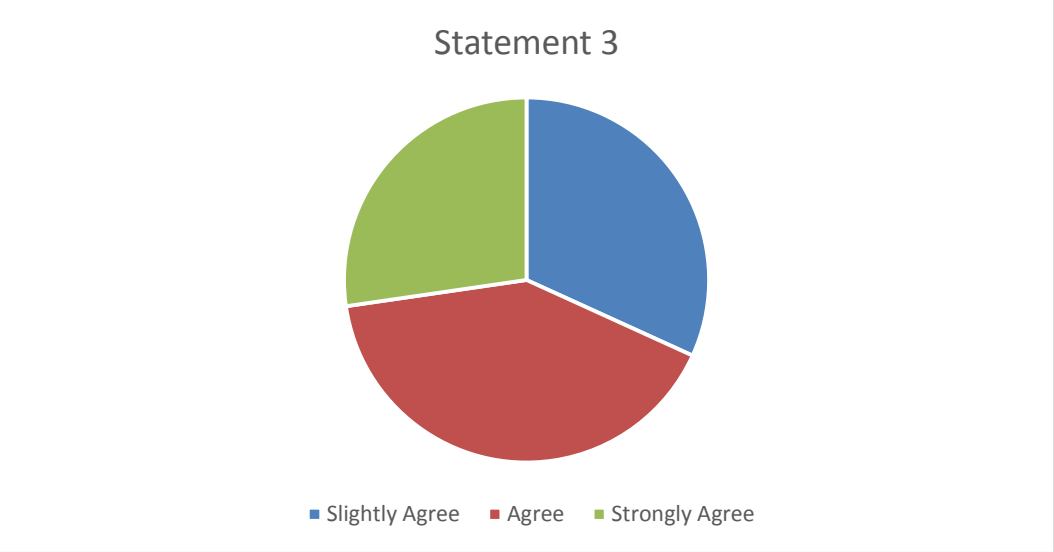

Figure 8. *Responses to goal being helpful in the future.*

The same answers were selected when participants were asked about setting academic goals helping them do better in school (Statement 4). As previously stated, this statement had the highest average response. Most of the participants, 86.3%, agreed that setting goals help them do better in school. Table 86, Table 87, and Figure 9 illustrate more detail about this statement.

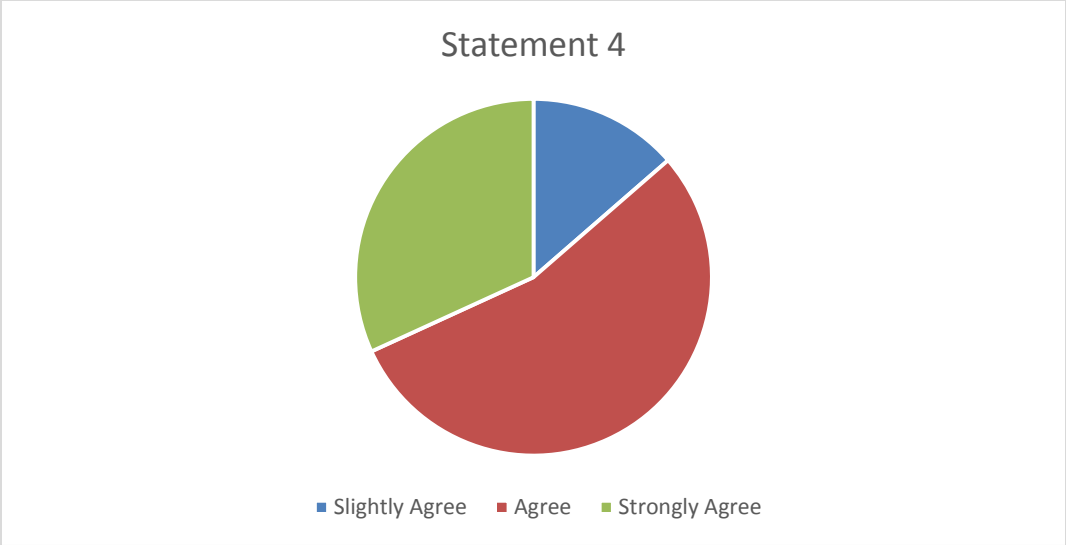

Figure 9. *Responses to setting goals helping participants do better in school.*

Participants were asked if they think a friend would benefit from a goal setting project (Statement 5). Over 80% of the participants agreed with this statement, whereas 4.5% of the participants disagreed with this statement. See Table 87 and Figure 10 for a more detailed chart of responses.

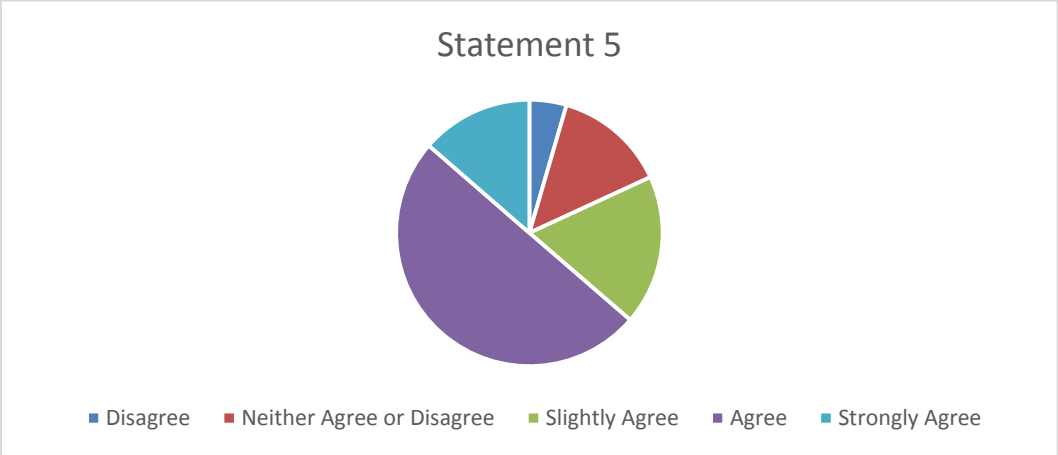

Figure 10. *Responses to friends benefitting from the goal-setting project.*

The sixth statement in the survey asked students to identify if the goal setting project was valuable to them. No students disagreed with this statement but 13.6% of the

participants were indifferent. The chart (Figure 11) illustrates that 86.3% of the students agreed in some way that the goal setting project was valuable (also See Table 87).

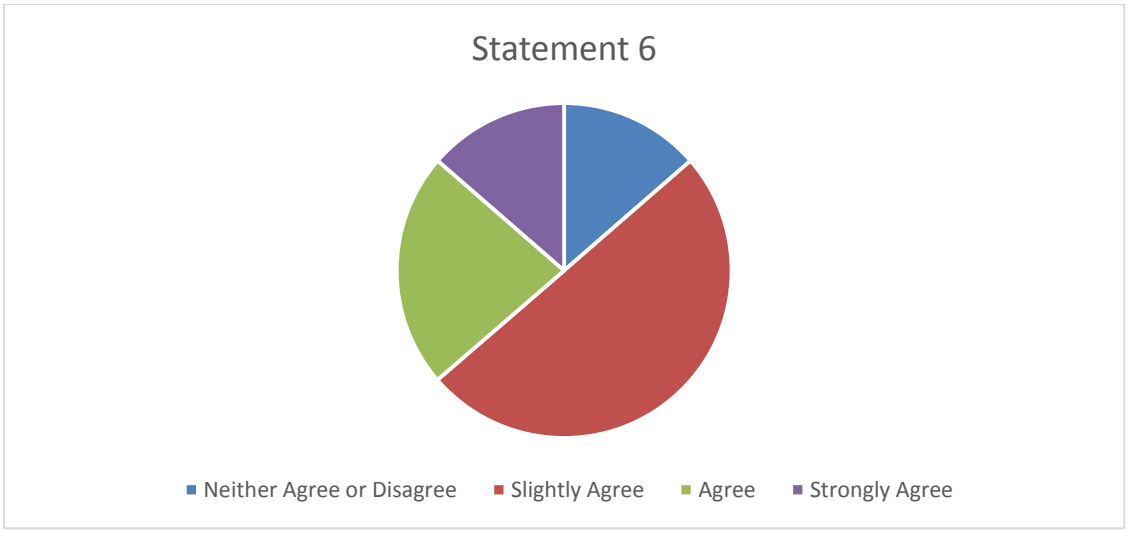

Figure 11. *Responses to the value of the goal-setting project.*

The seventh statement of the survey asked participants if they took the goal-setting project seriously. Fewer than 10% of respondents disagreed with this statement, but more than 80% either agreed or strongly agreed. For a more detailed breakdown of participants' responses, see Table 87 and Figure 12.

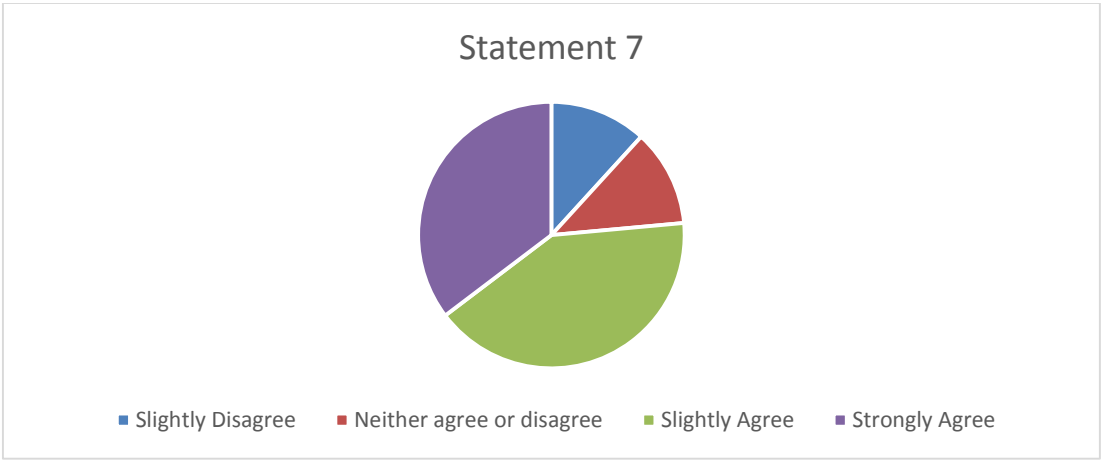

Figure 12. *Reponses to taking goal-setting project seriously.*

The eighth statement found participants answering if they thought the goal-setting project helped them with their grades during the nine-week intervention. Though 4.5% of the participants disagreed with this statement, over 90% of the participants agreed in some way that the goal-setting project helped them with grades. See Table 87 and Figure 13 for specifics of this statement.

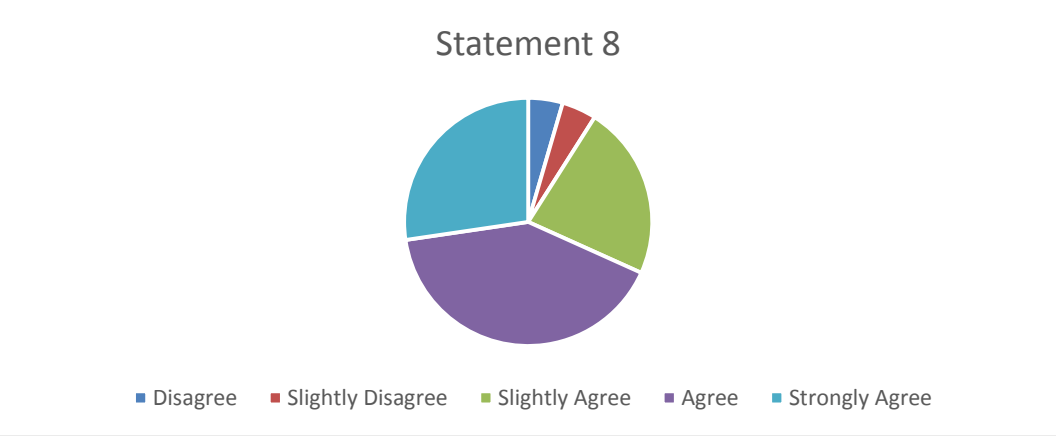

Figure 13. *Responses to the goal-setting project helping with grades.*

Participants were asked if they completed the project because it was required and did not gain anything from it (Statement 9). Though 13.6% of the participants slightly agreed, 77.2% of the participants disagree in some way with the statement. Table 87 and Figure 14 illustrate the specifics of this statement.

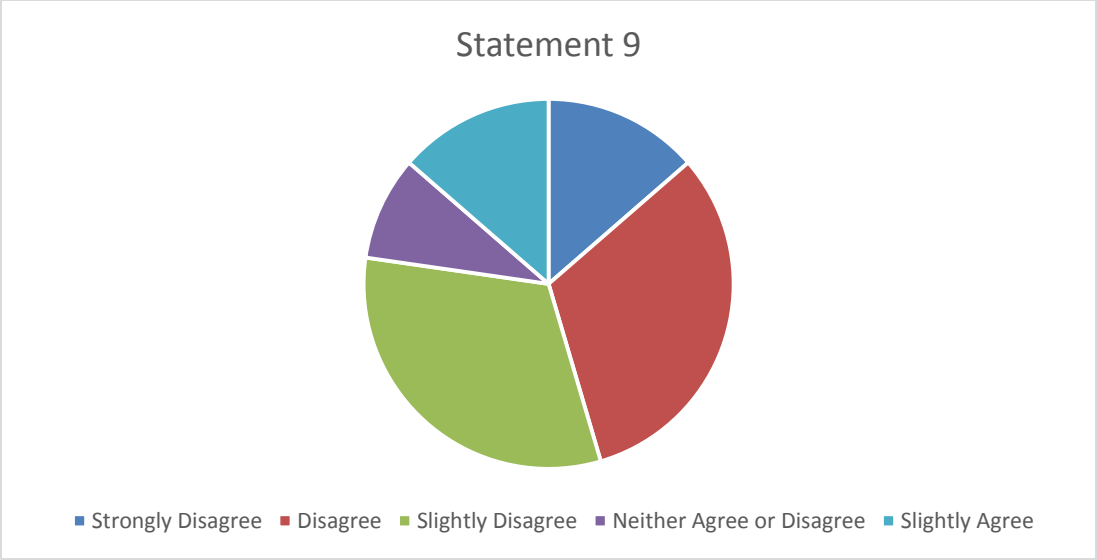

Figure 14. *Responses to completing the project due to requirement.*

Finally, participants were asked if setting academic goals and breaking them down into smaller sub-goals would help them do better in school (Statement 10). Four and a half percent of the participants disagreed where 91% of the participants agreed in some way that breaking goals up into sub-goals would help them in school (see Table 87 and Figure 15).

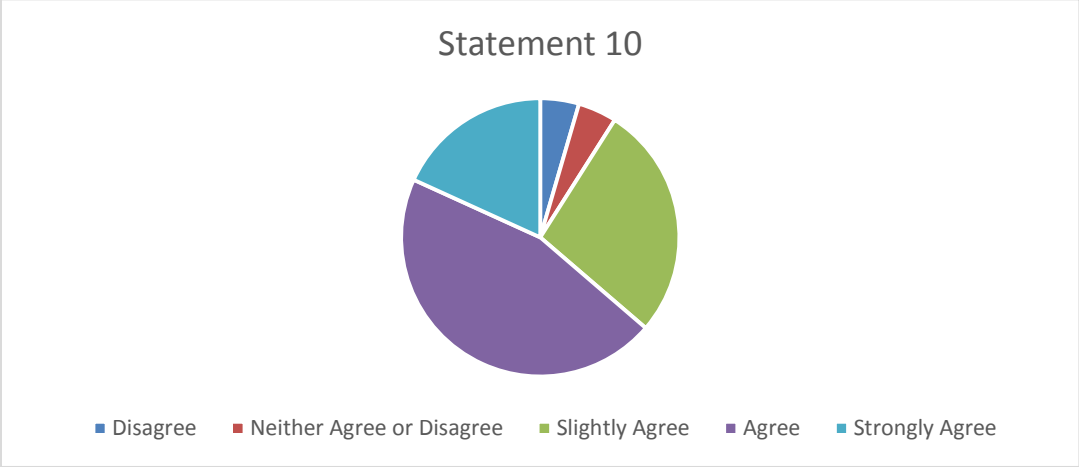

Figure 15. *Responses to breaking goals into sub-groups helping with school.*

Qualitative Findings

Qualitative data were collected during the intervention in the form of eight individual interviews for each participant which occurred weekly. During these sessions the researcher would use worksheets developed by McCoach (2011) to implement the prescribed intervention (Appendices E-M). During week one the students identified their interests and how they felt about themselves as learners. The second week of conferences had the student identifying their feelings about the class and how they could put forth effort if they are not producing to their satisfaction. During the third week, the students learned about interest, utility, and identity values. Students also suggested ways they could increase those values in their math analysis class. At week four, the students evaluated whether they could use the values to help them in class and then they examined the excuses which stopped them from being successful in school. Week five had students identifying short and long term goals and making a plan with checkpoint dates for those goals to be accomplished. During week six, the student listed goals they had beyond high school and then they made connections to how the class helped them achieve that goal. Week seven had the students defining and listing causes of underachievement. Weeks eight and nine had students rating their school-week on a scale from 1-10 and explaining the reasoning for the rating, how they felt they were doing in the class, and any modifications they made toward their learning. At the end of the nine-week intervention, each participant had been in goal-setting sessions for a total of 90 minutes.

Selected questions from the intervention sessions were used to report qualitative data findings These selected questions (Appendix Z) helped the researcher gather more data to address the research question: In what ways do participating students value a goal

setting intervention as it relates to a higher level mathematics course? . The researcher met with students assigned to a study block in order to ask clarifying questions that pertained to their feelings about a goal-setting intervention. Question topics included, but were not limited to, interest, self-assessment, short and long term goals, values, accomplishments and improvements (Appendix D). A digital recorder was used to capture students' responses to questions that were posed in 10 minute sessions conducted during their study block.

Patterns were examined in order to create the first code book. Member checking occurred by sharing notes with the participants in order for them to acknowledge that the transcription was an accurate account of the interview. From the first code book themes were identified and categorized into subthemes. Peer debriefing occurred by sharing the data with the teacher of the subject to check themes and subthemes. All ideas, themes, and large constructs were identified, and data was completed when saturation was reached.

The overarching theme in this study's qualitative portion was whether learners found the entire goal setting intervention or segments of it to be beneficial in their mathematics class. Of the twenty-one students interviewed, fifteen of them stated that they felt that goal setting was worthwhile for their mathematics program. The remaining six students shared that, though they understood the importance of a goal setting program and did benefit from certain aspects, they shared that the goal setting program was neither harmful nor helpful to them. Four other themes emerged; 1) the values students find in a goal-setting intervention, 2) the types of goals students identify when participating in a goal-setting intervention, 3) influences that affect a goal setting intervention 4) the

successful components of a goal setting intervention and 5) the importance of a mentor throughout goal setting

In the following sections each theme will be shared along with the concurrent subthemes that emerged as data was disaggregated. The narrative will start with the first theme which was the values that students found in a goal setting intervention. From this theme three subthemes were discovered: 1) attainment value; 2) intrinsic value; and 3) utility value. Students discussed the importance of these values to their goal setting. The next section will discuss the second theme which was the types of goals students use in a goal-setting intervention. The three subthemes that emerged from this theme were: 1) long-term goals; 2) short-term goals; and 3) the implementation of those goals. The third theme which was discovered in the data were the influences that affect a goal setting intervention. Students expounded on this theme by discussing three subthemes which influence how they set goals: 1) knowing themselves as learners; 2) using their grades to motivate their goals; 3) using time wisely when setting goals; and 4) other influences which affected goal setting. The last theme to be identified when setting goals was the actual belief the students had in a goal-setting program. Emergent from this theme were the five subthemes of: 1) enduring a high level mathematics course; 2) helping with the improvement of grades; 3) helping with a plan to improve performance; 4) the role a mentor had in goal setting; and 5) the habits students take from a goals setting intervention.

Theme 1: The values students find in a goal setting intervention. Emergent from this theme were the subthemes of attainment values, intrinsic values, and utility values. As students set goals for a higher level mathematics course, each goal is centered

on three specific values. The attainment value is when students view themselves as scholars and as such set goals that a scholar would set in an academic world. For example a student enrolled in a higher level mathematics class, who seeks the attainment value, would find satisfaction if they received a high grade in the subject. Those students who identify with the intrinsic value will enjoy going to the class and they will look forward to completing the activities that are assigned. Unlike interest, the student that identifies with the utility value needs to see how the class they are enrolled in now will relate to a future goal or reward. They don't necessarily need to be interested in the subject to find it usefulness. For example, many students shared that they knew they had to be successful in math analysis because the course was needed for the next required course in the advanced math track. Students did share that would not concentrate on these goals if it were not for a mentor or having them accountable

Subtheme 1: Attainment value. Students who have the attainment value have the motivation to succeed in set goals because they associate those goals with who they are as students. Students who identified themselves with this value realized that an important characteristic to have was tenacity. Mike, a gifted student, pointed out, "I know I can do it I just have to work for that task or for that goal and so what I have to do is just put in the time and just work as hard as I can to reach that."

Another student discussed that he took the class in order to determine if he could challenge himself and stick with it until June. The researcher asked the student to discuss why he challenged himself with a higher level mathematics course in his senior year. Austin, a non-gifted student, shared, "I wanted to see if I could take this course when

other kids usually opt for an easier class. I wanted to kinda test myself in order to see if I could be successful with a hard math class."

It was also evident that students who held the attainment value in high regard identified their success in the class based on the grade they earned. One student shared how the grade affects not only how he feels about the class but how he feels about himself as an overall scholar. Ryan, a gifted student, shared:

> Because I mean when you do poorly in a class your motivation goes down and I mean I think that like can affect you like not only just in that class but overall and if I do well in my class I think I will be a better student overall.

Other students felt that when they succeeded in the class it was because they regarded themselves in a positive way. Janice, a non-gifted student, explained that when you "are able to believe in yourself, you know you can do it, and you had that confidence in what you can do in class, it can really help you succeed in the class."

One student also expressed the importance of having an adult to report to throughout the intervention. Elijah, a non-gifted student, stated, "If it weren't for you bugging me I don't think I would be going these goals." Debbie, a non-gifted student, explained that, "When I have more confidence in myself I succeed in the class."

When students began to believe in themselves as math scholars they made connections between the skills they learned with goal setting and how those skills could be used in other subjects. Hannah, a non-gifted student, shared that the skills from the intervention helped her realize that learning, "revolves around preparation in a class so can you can understand it more." Janice, a non-gifted student, pointed out that "When

you set a goal you really do try to work for it. As I was setting goals for this I started setting goals in other classes." And a final thought from Debbie, a non-gifted student, was simply, "but if you (the researcher) weren't here, forget all the things I have accomplished because I know nobody would care."

***Subtheme 2: Intrinsic value*.** Students also found value in the class if it nurtured an interest they had with the material. When they connected to the material they found concepts easy to understand. Max, a non-gifted student, pointed out that, "If you're really actually more interested in what you're doing it just comes easier." Nicole, a non-gifted student, found that, "if you're interested in the subject then you'll be more engaged and you'll want to know how to complete each of the problems." Students discussed the importance of connecting to the material they learned in math analysis. Abigail, a non-gifted student, shared how interest relates to her motivation in the class. She stated:

> Without interest you're not going to be able to think ahead and think of how it can relate to your future. I just think without interest you won't be able to connect with the class and you won't work hard and you won't feel motivated to work hard.

Jessica, a gifted student, discussed that when she is interested in the subject it is something she will focus on especially when deciding to do homework. She explained:

> When I'm outside the school and I am at home I try to build up the motivation for doing my work. Doing my homework is the toughest part for me. I would say it is the toughest hurdle I face every night. However if I'm interested in the subject than I'm motivated to do the work.

Students also wanted to set goals when they were more interested in the material. William, a gifted student, pointed out that, “When you’re more interested in the topic then you’re going to set goals for yourself in that subject.”

It was important for the students to believe that if they performed at this challenging level then it was worth the time they put towards the course. Warren, a non-gifted student, pointed out:

> If a course or a topic doesn't align with what you personally believe or it doesn't feel like you can handle what the teacher is throwing at you, then you're not going to want to learn the material. You're probably not going to at least have that information sink in and then it's just going to be a waste of your time.

***Subtheme 3: Utility value*.** There were some students who found the utility value to be important as they worked through the intervention. During this process the math teacher would discuss how the material would be useful to the students in their coming years. Elijah, a non-gifted student, gave this example from class

> The teacher explained what it is going to be used for in calculus. During the lesson she would stop and say ‘And this is how it can be applied to Calculus.’ She then showed us how it will be used in the class we will be taking next year. Even though I’m going to college I will be taking Calculus. I think when she makes the material useful it is important because whether you like math analysis or not, she shows you how it is going to be useful in your future.

Other students saw the benefits of having this added to their instruction. William, a gifted student, said that, “If I know that I'm going to use what I’m learning in this class

in the future I think I'll be more likely to want to learn it." Jennifer, a gifted student, pointed out that, "When you are thinking about how you use the information from class in the future, you can connect the information you are learning to other topics or even the math analysis topic itself."

Some students shared that short-term goals were useful to help direct them towards their future. Alex, a non-gifted student, pointed out,

> Doing what you want to do in the future is going to tell you what you should do now and what short-term goals to set. You don't want to waste time with like something that's not going to help you in your future.

Theme 2: The types of goals students identify when participating in a goal-setting intervention. During the intervention students were asked to identify short and long term goals. Students discussed the importance of both types of goals and they also identified how to successfully implement each into their mathematics program. Discussions included the purpose of setting goals as well as how those goals could be achieved.

***Subtheme 1: Long-term goals*.** Students identified three main categories when discussing long-term goals. The first category students discussed were that long-term goal set the stage for where they are eventually headed. Jonathan, a gifted student, pointed out the long-term goals are "extremely important because they help to identify what is important which sets the stage for where you are going." Daniel, a gifted student, stated that "When I set long-term goals I'll be able to set certain goals that will help me reach that final thing I want to do in the future." Students felt that setting long-term goals

help keep you motivated. Renee, a gifted student, pointed out, “I think it's good because it gives you something to like strive for and go toward.”

Students also felt that long-term goals gave them a type of motivation. Gary, a non-gifted student, reflected:

> It's important to set up long-term goals that you know what you want to get done. When you set the long-term goal everything fits into place. It gives you a plan and helps you keep working so that you can really focus as you work your way up.

Jacob, a gifted student, felt that setting long-term goals gives you a focus on getting what you want done in the future. He shared, “It kinda like sets a quota on what you want to do so it helps you realize what you have to do and then you do it no matter what.” Jessica, a gifted student, stated:

> Setting long-term goals gives me a future picture of what I want to be. From there I can go back and set the goals I need and then I can get to the picture I set for myself. Without setting these goals you have no picture.

Many students decided to set specific long-term goals. Almost all of the long-term goals set by students in this higher level mathematics course centered on achieving good grades. Students gave actual long-term goals they had for the class. Alex, a non-gifted student, stated, “I really want to improve my test grades.” Mike, a gifted student, added, “In the long run I want to do better on my tests.” As students discussed using long-term goals to improve their test scores, Mark, a gifted student, emphasized that he wanted his long-term goal to be practical. He shared, “I want to get used to her tests. I want to be able to apply what I know to make the hard stuff easy.” Mike, a gifted

student, set a very specific goal for his grade. He stated, “I overall want to do well on tests. I want to get a 90% or higher on the tests.” Elizabeth, a gifted student, who has consistently been earning As in the class also centered her long-term goal around the grade. She said, “I want to keep my letter grade in this class.”

Subtheme 2: Short-term goals. Many of the students when they set their short term goals discussed how they keep them focused on their long term goals. Abigail, a non-gifted student, shared:

> Short-term goals give you something to like reach for when you are planning for your learning in the long run. I guess it gives you motivation to reach your long-term goal. If you don’t have your short-term goals then there is nothing to like go for.

Jennifer, a gifted student, discussed how short-term goals need to be in place in order for learning to be more advantageous and to give learners the motivation to keep working in the class. When discussing this further she stated:

> You always need something to go after when working in a high level math class. If you stop trying to go after your short-term goals it can hurt you. It is like the short term goals are just there and you're not trying to do better in order to reach them.

Daniel, a gifted student, agreed with this thought process. He felt that the short-term goals keep you focused. He went on to explain, “if you don't keep your eye on something, like your short term goals, then what you want to do in the long term might fall short in your achievements for the class.” Other students shared that short-term goals help them stay focused and keep their momentum toward obtaining their goals.

Jessica, a gifted student, shared that without her short-term goals she would lose focus. She stated:

> There's always a reason to set short-term goals because it's like setting a placement for where you want to be in the class instead of thinking 'oh I'll just go with what I have.' Your short-term goals help keep you focused so you can eventually get to your long-term goals.

In further discussions with students they pointed out that short-term goals affect who they were as students in a higher level mathematics class. One student shared how short-term goals set who he is as a student overall. Elijah, a non-gifted student, shared, "short-term goals always makes you strive for something that you don't have which I think makes you better person." Another student shared how reaching a short-term goal would make him feel about his learning. Jonathan, a gifted student, stated:

> Short-term goals help you to achieve the goals you set for yourself. If you reach your short-term goals then in the end you can feel good about reaching that goal which should affect how you are doing in the class.

Another student discussed how setting short-term goals motivate you so you have the tenacity for the learning process Warren, a non-gifted student, pointed out, "Working on your short-term goals motivate you to want to do well later. That means you are going to want to work hard at school."

Some students shared how their short-term goals were specific to the kind of work they wanted to complete in and out of class. They felt by specifically identifying certain skills that they would obtain their short-term goals more efficiently. Hannah, a

non-gifted student, discussed how the short-term goal of studying would help her be successful in this math class. She stated:

> My short-term goals are that by studying more I will get to my long term goal of getting a better grade. By studying more for the quizzes now I will know what steps to take and how to set specific smaller goals. By knowing which smaller goals to set that will help me to reach the bigger goal of earning an 'A' in the class.

Studying seemed to be the short-term goal most students identified to help them achieve their long-term goals. Ryan, a gifted student, shared, "In order to get to my long term goal I want to study every night, when I'm done my other (non-math) homework or I'm not working on any other homework." Gary, a non-gifted student, pondered on his study habits by saying, "My short-term goals would be that I want to change my study habits so the amount of time I spend studying increases in this class." Alex, a non-gifted student, explained, "The short-term goals I want to do right now is study math analysis every other day." Elizabeth, a gifted student, who continually received the highest marks in all three classes. Though it was hard for her to come up with goals in order to improve her grade she did state, "I usually don't need to study but I want to make an effort to study."

The other prominent short-term goal students discussed was completing their homework. In this class homework was assigned for practice each night. The teacher did not collect the assignments until right before a unit test was given. Though students understood how important quizzes and tests were, they realized that homework was an easy way to earn many points in the class. Some identified their short term goals around

the homework. Daniel, a gifted student, discussed that he usually waited at the last minute to do his homework which made for a long night before the test. He created his short-term goal around this habit by sharing, “I want to continue to do my homework on time.” William, a gifted student, who was in the same situation, also set his short-term goal around a specific time for completing his homework. He stated, “I want to complete my homework on the night it is assigned.” Janice, a non-gifted student, explained that not only was she going to do her homework on time but she was also going to get a perfect score. She discussed:

> My short-term goal is to get the perfect score on my homework. I will plan on doing all the problems each night. I will also check the answers with the book or with a friend so I am absolutely sure they are correct.

Subtheme 3: Implementation of the goals. Many of the discussions that were had about either long-term or short-term goals led to discussions about what happens if they either are or are not implemented correctly. Students cogitated about the structure of implementation, the consequences of not implementing goals correctly, and why implementation is important. Jacob, a gifted student, discussed how the structure of having short and long term goals is important. He said:

> If you don't have any structure when you are setting long-term and short-term goals then it’s very easy to procrastinate. It is very easy to fall behind in the class. If you don't set these goals it could lead to not having good habits. That would make for a very tough time in the class.

Renee, a gifted student, shared how your goals should align with what you are trying for in the class. She stated:

> Your goals should match what you want to do in the class. If you're not trying to go for what you have set for yourself you may find that you are going for things that you really don't want to accomplish in the class.

Mark, a gifted student, shared that if goals were implemented correctly it could set one up for success. He shared:

> Setting goals make you want to want to fulfill them. If you are successful in setting goals that means you won't fail now because you know in order to achieve those goals you're going to have to work on it now.

Another student discussed why a timeline is important to set when looking at goals. Austin, a non-gifted student, stated:

> If I want to achieve the goals that I've set for myself now or that I want to achieve in the future it's important to start working towards those goals now so that I can get a head start. If I start working on them now I will hopefully achieve those goals

Jennifer, a gifted student, discussed that if she knows a timeline then it helps her in the planning process. She said, "Setting goals will help me because when I do it gives me an endpoint. When I see the end I can lay down specific steps to get me to what I want to accomplish." Jacob, a gifted student, was specific about the advantages to having a well laid out plan. He discussed:

> Setting short and long term goals let me plan ahead and do research to determine what I have to do to achieve my goals. I would rather do this than just going in

> and not knowing what to do or what's going on with where I want to go in the class.

Many students discussed how implementing their goals now will help set them up for their future. Nicole, a non-gifted student, stated, “Setting goals helps me now because I can set a specific goals to help me with my future plans.” Another student described how setting goals for the future can help them with their motivation to work now. Debbie, a non-gifted student, articulated this point stating, “Setting goals now will give me a motive to work hard. When I do set them now I can achieve my goals in the future.” Renee, a gifted student, further explained how setting goals help her shape her future. She shared:

> Setting long and short term goals help me realize what I need to focus on in this class. By doing this I can see what steps I need to take and what goals I need to make in order to get there now.

Theme 3: Influences that affect a goal setting intervention. When students are participating in a goal setting program there are influences that either helped or hinder their progress. Students discussed that though they see the value to goal-setting they were honest in their discussions about the fruition of identified goals. Some hindrances of goal setting were time management, not having self-regulation skills, and other commitments

Subtheme 1: Knowing themselves as learners. Students felt it was important to identify who they were as learners. Generally when they knew what their strengths were it would help them adjust their learning accordingly. Jacob, a gifted student, stated

> It’s definitely important to assess how you are as a learner. If you know this information you can identify what techniques work for you, how to study, and

> things that makes the entire process of learning a lot easier. Especially in your explanation to the teacher. You can explain maybe I'm more of a hands on learner, more textbook, or even a visual learner. Then the teacher can work with that information.

Other students were more specific in the learning skills needed to be successful in goal-setting. Hannah, a non-gifted student, shared,

> I think it's important for me to like listen in class because when the teacher is either talking to me or explaining in class, I understand the information better. Then if I'm not listening in class or like I doze off then I'm not going to understand it when I get home.

Debbie, a non-gifted student, pointed out that listening skills help you achieve the goals of the classroom. She discussed, "The most important roadblock I have hurdled is sharpening my listening skills. This is because the teacher mentions a lot of important when she is lecturing. If I'm not listening than I miss a lot."

Several students shared, in quick responses, what they felt was a small hurdle to get them on their way to setting goals. Nicole, a non-gifted student, stated, "Seeing something visually has to happen in the classroom for success." Warren, a non-gifted student, shared the thought, "I think being able to see something visually helps me learn a lot better." Janice, a non-gifted student, who is identified in the arts program at the school, stated that, "I have to see something to 'get it'." Renee, another gifted arts student, chimed in with, "I think that I'm like everyone else in the visual sense. When I need a visual in front of me to help me like fully comprehend it, I make sure to have it."

Many students shared that paying attention was crucial to success. Abigail, a non-gifted student, agreed with this by saying:

> I believe that paying attention in class is a very important. I think definitely listening in class is just as important. Also when a visual is added it helps with learning. I can't just listen and understand. I have to see something and then do something hands-on with the activity.

Jessica, a gifted student, shared that:

> As a learner I like to see everything {visually} that I need to do. That way I can reflect on myself and realize that I have to use critical thinking in order to do these problems. This is an important skill, especially in math. I need to see it visually presented or I will not be successful in the class.

A group of students reflected that if you know who you are as a learner you can change your study habits appropriately thus leading to success. Alex, a non-gifted student, went further into detail by stating:

> It's really important to know who you are as a learner. If you do that can bring success because the fact that you can see like if you're doing well what you need help with. This would have you getting people to help you with your weak spots. For example, you might not be doing well on quizzes but you might be doing well with the homework so you get help with test taking.

Elizabeth, a gifted student, shared, "It's important to know how you study as a learner because if you're doing well you know what you're doing you keep doing that. If you're doing poorly you have to try new ways to study." Mark, a gifted student, agreed with this by saying, "Knowing who you are as a learner is important because if you need to

study harder to change some of your habits in order to get the grade you want then you have overcome something."

Subtheme 2: Using grades to motivate. Grades were a huge motivator to help students overcome roadblock in order to be successful in the class. Their definition of successful was passing with an A or a B letter grade. In several statements students described that grades were important to their success in math analysis. Jennifer, a gifted student, shared that, "It is important to get good grades in order to have a basis for how hard you have to work." Austin, a non-gifted student, discussed that it was important to keep track of progress using grades. He told the researcher, "It is important to get good grades in order to have a basis for how hard you have to work and what you have to do to improve." Jennifer, a gifted student, shared how her grades actually motivated her. She stated, "Good grades are important. If I didn't know my grades I wouldn't have something to strive for in class. They motivate me."

Other students shared how knowing your grade helps you plan for improvement. Ryan, a gifted student, shared, "When you look at your grades you can see where you stand and what you need to do in order to get the grade." Renee, a gifted student, stated, "Knowing your grade lets you know where you are and what you need to work on. You will also realize how hard you need to be working."

Not only working for the grade but keeping it up was also mentioned as an influence that helped the grade. Elijah, a non-gifted student, pointed out, "Knowing your grade lets you know whether or not or how hard you have to work to either pick up (your grade) or keep your grade where it is at." Gary, a non-gifted student, added on to this by describing what happens when students don't know their grade. He said, "If you don't

know your grade it you will get a false sense of security and you may not work as hard as you should be."

Hannah, a non-gifted student, did discuss how knowing your grade can lead to stress in a higher level mathematics course she shared:

> I check my grades too much. When I do this I can add more stress to my life. If I'm not doing well I stress out about my grade and sometimes find it hard to work. However I know if I don't see my grade then I won't actually see how I'm doing in the class. I need to know how to prep for the class in the best way.

Subtheme 3: Using time wisely. Students realized that time was a huge roadblock to their success. Many of these students have done well in school. Earning grades came fairly easy to them and it wasn't until this class that many of them found themselves not knowing how to schedule their time. Balancing their school life, home, and work to be done for class proved to be a huge influence on the goal setting intervention. Daniel, a gifted student, pointed out:

> I have problems mainly with studying and time management. I find it hard with my homework along with things that I have to do at school. Along with school and sports and other activities it is quite difficult. I have had to use time management to get all my work done**.**

Other students aren't quite sure how to make the best choice when it comes to time management. Debbie, a non-gifted student, described her situation:

> My roadblock is time management because I know I could manage my time better. I also think like when it comes to tutoring, and getting extra help, I think more like; 'will somebody be able to pick me up" so will it be that helpful when

> I should just go no matter what it and then just like take the bus home or even if it won't be that beneficial

One young man in the class said that if you don't have good time management it might hinder your progress. Jacob, a gifted student, shared "If you don't manage your time then you will procrastinate which will cause you to fall behind and you don't really know what's going on in class.'

Many students in the class felt that roadblocks for them were how they could balance other classes and the work they receive from them. Alex, a non-gifted student, stated, 'I think a roadblock would be if I have homework for another class." While William, a gifted student, added, "I think the roadblocks I have are like trying to balance the math and everything with my other subjects." Max, a non-gifted student, went on to further explain:

> Other classes will be in the way. You will have to shift your attention from the goal you have set in math analysis to like another class. I don't have a lot of time to spend looking over notes. If the teacher gives more homework than it is very hard for me to meet my goals.

Subtheme 4: Other influences that affect setting goals. Students identified that not only did other classes hinder their ability to reach their goals but other commitments they set for themselves or were set for them affected how they approached this intervention. Abigail, a non-gifted student, shared that other commitments, she is training as a competitive gymnast, were a distraction. She shared, "extracurricular events outside the school stop me from achieving my goals because I have to be at the gym usually about four hours every day. This causes me not to manage my time wisely. I then slack in

meeting my goals." One student shared how sports get in the way of setting his goals. Max, a non-gifted student, stated, "Another roadblock would be not having enough time after school before soccer practice in order to finish my homework so that could hinder me from reaching my goal."

Some students discussed how their work schedules influence their ability to meet their goals. A student explained that working in the family store influenced his success with this program. Gary, a non-gifted student, discussed, "When I have to go to work at the family store there is hardly a way for me to complete my homework. This means there is no way I can work on goals I have set for myself in the class." Jacob, a gifted student, explained that work and activities got in his way. He shared, "Some things that get in my way of setting goals are other extracurricular activities or things I have to do after school. If I have to work afterschool there is no way I can think about them (goals)."

Daniel, a gifted student, explained the stress he felt from his family. He shared that setting and reaching goals in the class tended to be out of his hands. He stated:

> A huge way I can't meet my goals is when I have to be somewhere or my family has to be somewhere. This means going to birthday parties, soccer tournaments, or other sporting events that my sister and brother play. I have to focus on my homework which prohibits me from working on goals.

Another student also found this to be his problem as well. Ryan, a gifted student, shared:

> Things that would stop me from my goals could be other commitments that come up. So if a practice or a meeting or something that takes time out of my day or I'm

> not able to spend as much time doing math or biology that I had planned on doing, those things are major influences.

Eventually students felt the stress caused by these other commitments outweighed a goal-setting program. Nicole, a non-gifted student, summarized this:

> Sometimes there is no way I can meet goals. Other things I have to do, like other homework or extracurriculars will get in the way. If they get in the way then the whole situation is going to be a lot more stressful. I'm constantly telling myself to do better. I'm will say to myself 'if I don't do better then it's going to drop my grade.' This has me focused on the grade and not my goals.

Theme 4: The belief in a goal-setting program. When students were asked their overall opinion of a goal setting program most all of them (71%) said that the work they did helped them in math analysis. Though the other students (29%) shared that the goal-setting program did not make a difference in their lives, they also explained they found the value for others. Many students were able to identify the specific ways this intervention was beneficial for them.

Subtheme 1: Enduring a higher level mathematics course. Students were most proud that they had not dropped the class even though they saw others withdrawing. At the beginning of the year the class had thirty students. When the study began there were twenty-four students left in math analysis. Four students shared their feelings about sticking with the program. Austin, a non-gifted student, said, "I want to keep sticking with this course and seeing it to the end." Mike, a gifted student, exclaimed, "I am happy that I was able to survive math analysis." Jessica, a gifted student, shared, "I'm really

understanding the class and am sticking with it." Warren, a non-gifted student, said," It is important to do what is necessary to stick with the class"

Students started to discuss the advantages of staying with the course. One student shared that it was important to his learning. William, a gifted student, stated, "When we are learning something in class I am starting to understand it because I have not given up." Mark, a gifted student, shared how being dedicated to the class changed his habits. He said, "I have been looking over my homework, determining where I am struggling, and forging on to finish it out."

It was important for other students to either please their parents or surprise others by staying enrolled in the class. Alex, a non-gifted student, stated, "I want to work hard to obtain the grade I wanted to surprise people that I saw it through." Jessica, a gifted student, student, on the verge of dropping the class, discussed how her parents were the ones who kept her enrolled in the class. She said, "I really wanted to quit but my parents talked me into staying and I'm glad I stayed."

Subtheme 2: Goal-setting helped students with their grades. An overwhelming percent of the students were excited that at some point they received an A in math analysis. When discussing if the goal-setting program was worthwhile they explained that the program helped them maintain high grades in the class. Several students shared the following; Renee, a gifted student, stated, "I'm excited to be only one point away from an A." Mike, a gifted student shared, "I'm pretty happy that I have an A for the time being." Daniel, a gifted student, exclaimed, "I am happy because for right now I have an A." Ryan, a gifted student, said, "I have kept my grade at an A- this whole quarter." Nicole, a non-gifted student, shared, "I'm pretty happy that I kept that A up in class." Warren, a non-gifted

student, pointed out that “I’m pretty impressed with myself that I had an A for a while.” Alex, a non-gifted student, said, “I have an A for right now though it is unpredictable.” Hannah, a non-gifted student shared, “I’ve earned two As on my mini-quizzes and I am pretty exciting about that.”

Some students were specific on which grades made them most excited. Janice, a non-gifted student, shared, “I have studied hard for the mini-quizzes and have gotten good grades on them.” Elizabeth, a gifted student, stated, “I am most proud of the test grades that I have gotten in this class.”

Throughout the study students checked in with their parents to share their progress. Some parents were surprised by how well their child was doing in the class. Alex, a non-gifted student, student pointed out, “My parents and I set an expectation of getting a C in the class. I currently have a B so I’m doing better than the set expectation.”

Subtheme 3: Goal-setting helped students plan to improve performance.

Students expressed how a goal-setting program helped them to form plans or programs to improve their grades. Jonathan, a gifted student, shared that having a goal-setting program helped him improve his grade. He stated, “Goal setting helped me in this class. After I set a goal I saw how it helped me to improve my grade in math analysis.” Another student shared that without the program his grade would have been lower. Elijah, a non-gifted student, said, “I think this program was worthwhile because without it I probably wouldn’t have the grade that I have now. My grade would be lower because I wouldn't be doing much of the homework.”

Other students shared how having this program in place helped them develop action plans to keep their grades up. Mark, a gifted student, discussed the connection

between the goal-setting program, his grade, and his homework. He shared, “I believe goal-setting was worthwhile because it did help me increase my grade and helped me finish all my homework.” Debbie, a non-gifted student, shared how goal-setting helped them concentrate on grades. This student stated:

> I do feel that goal setting program is worthwhile. Setting goals helped me concentrate on my assignments. Evaluating those goals helped me get focused on bringing my grades up if they were slipping. Setting goals had me focused and finding success in the class.

Trevor, a non-gifted student, shared how they reflected on their performance in class due to the goal-setting program. He shared, “I feel it was worthwhile because it helped me think about certain things I do in association with the class. That helped me plan to do better in the class and on my homework.” Elizabeth, a gifted student, discussed how the class helped her plan for better performance. She stated, “I think the goal setting was worthwhile because it helped me to see what I needed to work on and help me prepare better for the class.” Mike, a gifted student, shared how goal-setting helped me get to the end he wanted. He said, “I think goal setting was worthwhile because it helped me see where I wanted to go in math analysis and how I can get there.”

Students also shared that by using goal setting you can identify the skills you need to plan for better performance. Jennifer, a gifted student, shared, “Goal setting was worthwhile. This program really makes you think about what you're doing wrong and where you need to put your effort.” Jacob, a gifted student, discussed the importance of monitoring grades. He stated:

> The reflection portion of goal-setting helped me to see how I'm doing in the class. I was keeping up with it and monitoring my grades. Based on this information I was seeing if I could make any changes that'll help benefit me in the long run.

Max, a non-gifted student, summed up how goal-setting can give you the necessary skills to be aware in the class. He felt that this then led to success. He discussed:

> I think goal setting is worthwhile because it helps. Any goal setting program that can help show a student that they need to be aware of what they're doing at all times with their grades is worthwhile. It helps students keep up with their grades, to know how they're doing, and what they need to work on in the class.

Subtheme 4: The role of a mentor in a goal-setting program. One prevalent discovery of the goal-setting intervention was the accountability students felt towards the researcher in the process. Students shared that they were successful or that they completed their goals because they needed to meet each week with the mentor. In one discussion Ryan, a gifted student, shared the following:

> I'm usually a good student. I do my work but only the homework and studying for tests. Because I was doing this with you (the researcher) I was doing things I would not have done. Outside of class I was watching videos and working with people. To be honest I wouldn't have done that if I didn't have to meet with you every week.

Other students said they learned how to be successful in the class based on the conversations that happened between mentor and student. Daniel, a gifted student, stated, "I think the program was worthwhile by the progress that you showed me. I feel our discussions were beneficial in the long run grades because my grades raised

significantly.” Hannah, a non-gifted student, shared that conversations gave her confidence in the class. She shared, “I absolutely feel like goal-setting was worthwhile. I looked forward to talking to you because it made me feel better about my great even if it wasn't that ‘A’.”

Elizabeth, a gifted student, who was indifferent to the program she did share the importance she felt about a mentor. She stated:

> I didn't like feel good or bad about goal-setting. It wasn’t the thing that made me a better student. It didn’t like help me or hurt me but I guess for like other people it helped but I don't see how it would hurt anyone so I guess it’s good. I mean like personally I believe the most important part was that it was good to know someone who cared was going to talk to you each week.

Subtheme 5: The habits students will take from a goal-setting program. Those students who found goal-setting to be an advantage shared what they would take from the program. One student shared that the strategies she learned in the program transferred to other classes. Renee, a gifted student, stated , “I think that it was worthwhile because it as I started setting more goals for myself my grades started to improve but I started to feel more confident in the work I was doing goal.”

Another student also agreed that a goal setting program would help in other areas of a student’s life. Jonathan, a gifted student, shared, “When you really focus on a goal that you set it will help you improve in what you're hoping to achieve. Setting goals will help you improve on other aspects along the way.”

Many students shared that by participating in a goal-setting program they had many ‘take aways’. One student shared that he learned some lifelong skills. Austin, a non-gifted student, stated:

> The thing I want to take away from this program is the fact that I think goal setting can be beneficial to anyone. It will help you keep up your grades up and stay focused. When you do this you will be able to maintain making good grades.

Another student discussed that it was important to keep your grades up and that goal-setting help him see ways he could do this. Gary, a non-gifted student, shared:

> I want to keep on setting goals for myself in the future. I don’t want what we did together to be a one-time experience. I want to keep on using what I did with you to help me with all my other classes.

One student enthusiastically shared what she would take away from the program overall. Jessica, a gifted student, summed up her feelings by stating:

> I want to take the goals we used in this with me to other classes. That’s like my ultimate goal and I guess for the rest of high school. I should also use this for the rest of college because obviously homework is a big thing. I want to take all these things with me and just improve on the process as I go through my school years.

CHAPTER V: DISCUSSION

This study compared the performance and attitudes of gifted and non-gifted students who either received a goal valuation intervention or did not. Both groups of students were enrolled in a higher level mathematics course. Overall academic performance and academic attitudes (i.e., self-perception, motivation/self-regulation, goal valuation, attitudes toward teachers, and attitudes towards school) were measured both quantitatively and qualitatively. Each group of students was comprised of the following subgroups: 1) underachieving gifted students, 2) achieving gifted students, 3) underachieving students not identified as gifted, and 4) achieving students not identified as gifted.

In this mixed methods study, the control and experimental groups were compared in terms of their overall academic attitudes as measured by the quantitative School Attitude Assessment Survey–Revised (SAAS-R); (McCoach & Siegle, 2003) and academic performance as measured by grades in a Math Analysis course gathered at three different intervals (Figure 2). These intervals occurred four weeks into course, eight weeks into course work and 12 weeks into course work.

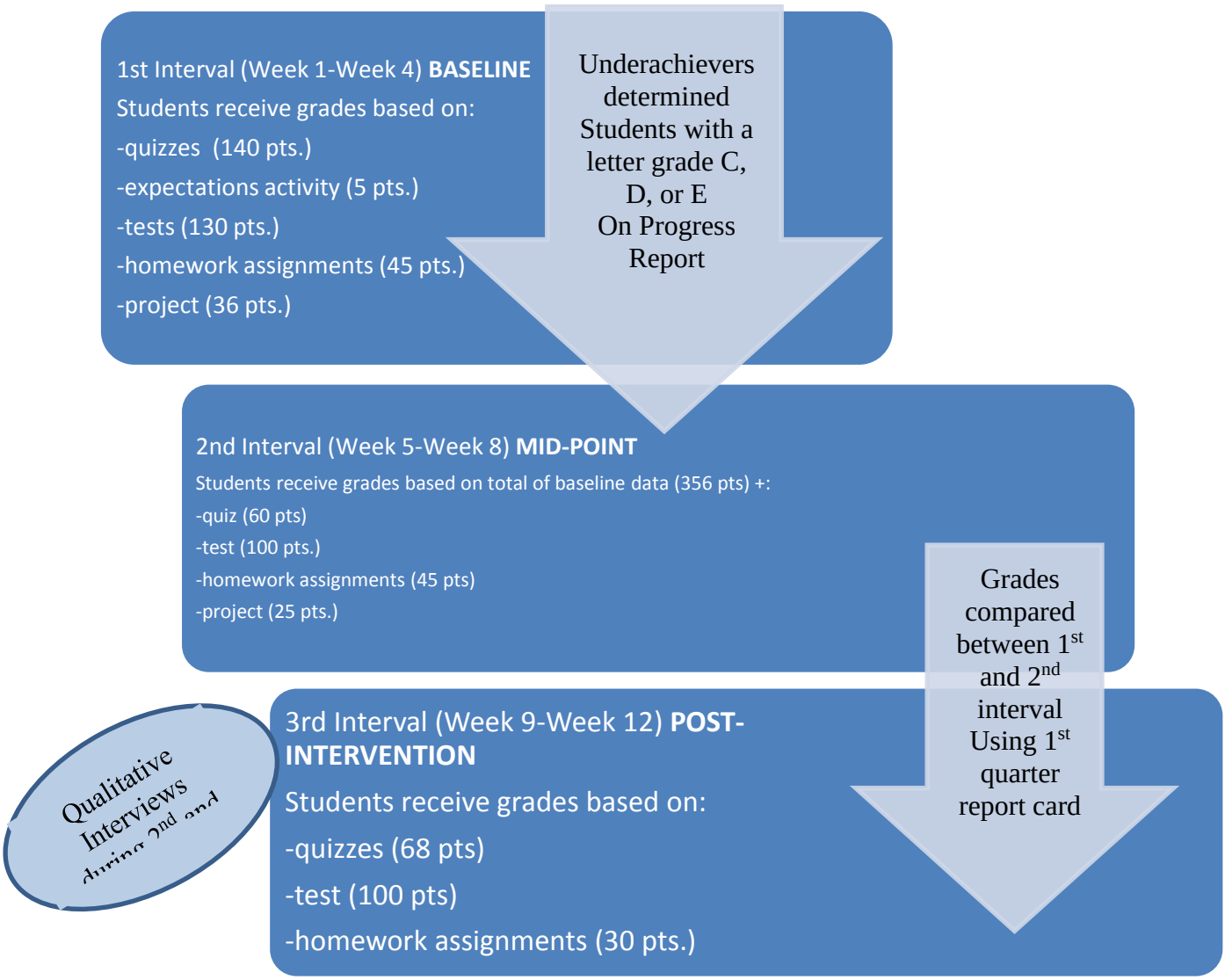

Figure 2. Intervals of data collection

In addition, an exit questionnaire was administered to all student participants within the treatment group immediately after the last intervention session. This questionnaire was adapted from the Exit Questionnaire, created by Sivaraman (2012), used with her permission (see Appendix O for revised Exit Questionnaire – Revised) and referred to in this study as the Exit Questionnaire – Revised. The ten-item questionnaire asked students to evaluate aspects of the intervention such as whether they liked the intervention,

whether they would recommend the intervention to their friends, whether they would be willing to participate in more goal-setting exercises, and whether they thought the intervention was worthwhile to them. The Exit Questionnaire-Revised consisted of items which were graded on a 7-point Likert-type scale, ranging from *Strongly Disagree* (1) to *Strongly Agree* (7). This instrument provided quantitative data to gauge students' opinions of the intervention and to determine whether having positive opinions about the intervention and goal-setting, in general, can be associated with any change in these students' actual academic performance.

Qualitative data were collected through one-on-one goal-setting sessions and interviews designed to determine if the goal setting intervention was worthwhile in an advanced mathematics course. These interviews took place for eight weeks during Interval 2 and Interval 3 (Figure 2). The intervention was administered to the experimental group over a nine-week period.

Findings from this study have implications for future researchers seeking to understand students' responses to the goal-setting intervention implemented in this study. Study results also have practical implications for those interested in incorporating this particular goal-setting program into their own school systems, schools, and classrooms.

The remainder of this chapter will be divided into five sections. The first section will summarize major findings with reference to the five research questions and their attending hypotheses. The second section will address the implications of the research, the third section considers the limitations of the study, and the fourth section will discuss recommendations for future research. The final section summarizes the study and presents the conclusions drawn from the study.

Major Findings

Participants' grades and responses to the SAAS-R, the Exit Questionnaire-Revised, and the one-on-one interviews provided data for this study that were both interesting and useful. A total of 48 students participated in the study. Of these 48 students, 22 were in the experimental group, and 26 were in the control group. There were 11 students identified as gifted and 11 students identified as non-gifted in the experimental group. There were 17 gifted students and 9 non-gifted students in the control group. There were 3 gifted underachievers in the experimental group and 7 gifted underachievers in the control group whereas there were 8 gifted achievers in the experimental and 10 gifted achievers in the control group. There were 6 non-gifted underachievers in the experimental group and 1 non-gifted underachiever in the control group. There were 5 non-gifted achievers in the experimental group and 8 non-gifted achievers in the control group (see Figure 16).

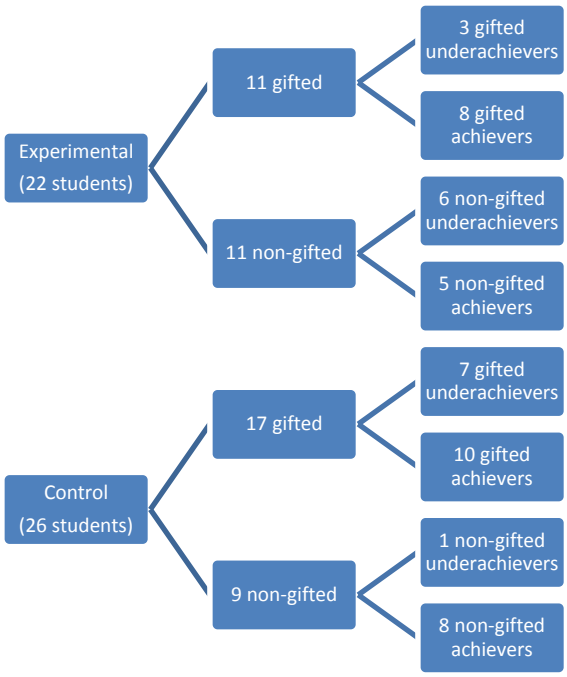

Figure 16. Groups to be compared in the study.

In order to gain qualitative data, the 21 experimental group students who had a study block in their schedule were asked questions pertaining to each week's goal-setting strategy. From these data, themes and sub-themes were identified. The next few sections will summarize the results associated with each of the five research questions.

Research question one: How do underachieving gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of overall academic attitudes? In order to determine the impact that personal goal-setting had on students from the intervention group, 35 analyses were run in order to compare academic attitudes.

Much of the data did not provide statistical significance between the experimental and control group. Statistical significance was found for one subscale as described in the next paragraph. When comparing gifted students, who received the intervention, to those gifted students who did not, there was no statistical significance found from the other four attitudinal subscales.

When comparing gifted underachievers in the experimental group to gifted underachievers in the control group regarding academic self-perception, the researcher found that students who participated in the intervention had a higher academic self-perception than those gifted underachievers in the control group, leading the researcher to reject the null hypothesis. These findings support earlier findings that students with strong self-perceptions and positive attitudes toward school have greater achievement motivation which, in turn, is related to greater academic achievement (Clemmons, 2005).

Other analyses compared students in the intervention and control groups according to the following subscales of the SAAS-R: 1) motivation and self-regulation;

2) attitudes towards teachers and class; 3) goal valuation; and 4) attitudes toward school, In each of the remaining 34 analyses related to the subscales of the SAAS-R, the researcher failed to reject the null hypothesis. These results could be due to the small sample size of this study as well as poor teacher interaction. As grades dropped in math students started to become more negative towards the teacher. They shared with the researcher that practices were unfair and the preparation for assessments were lacking. Debbie, a non-gifted student, stated, "I just don't get her. She teaches us one thing in class but she tests us on something else. It's not right." William, a gifted student, added, "Though she tells us that we have the skills to do her test, I have no idea what to do when I'm looking at the test."

Another reason for the results is the lack of real world connection. Many students did not find the value in math analysis. They felt that the course didn't prepare them for anything other than their next math course. Ryan, a gifted student, stated, "The only reason I'm in this class is cause I'm taking Calculus next year." Other students just had a general disinterest in school and therefore math analysis. When asked why Jonathan, a gifted student, went from straight A's in his previous math courses to straight Es in his math analysis class, the study replied simply "I don't really care."

As students struggled with the math subject their motivation to do well seemed to drop. In their study, Ford and Antoinette (1997) found that when student's grades dropped during the intervention, students struggled with motivation. This was observed as well during this intervention. One student shared the following:

> Because I mean when you do poorly in a class your motivation goes down and I mean I think that like can affect you like not only just in that class but overall and if I do well in my class I think I will be a better student overall.

Most students in this math analysis course indicated that grades were a strong motivator for them, as indicated by what students shared about their goals in the class. Daniel, a gifted student, stated, "I really want to improve my test grades." Alex, a non-gifted student, added, "In the long run I want to do better on my tests." These students did not improve or earn the grade that they wanted. An outcome to their goals not being reached could be the development of a poor attitude towards math and school in general which may have influenced the outcome of the analysis.

Research question two: How do underachieving gifted high school students who participated in a personal goal-setting intervention compare to their non-participating peers in terms of actual academic performance? In order to determine the impact that personal goal-setting had on students from the intervention group, analyses were run at three different intervals (see Figure 1): 1) the end of the 1st Interval (mid-point data taken at week four of the intervention); 2) the end of the 2nd Interval (post intervention taken at week eight of the intervention); and 3) at the end of the 3rd Interval (total intervention taken at week twelve of the intervention). In order to compare the control groups' academic performance to the experimental groups' academic performance, *t*-tests were used to compare the control group and experimental group at the 1st and 2nd Interval in order to determine if analyses of variance (ANOVA's) or analyses of covariance (ANCOVA's) were to be implemented. Levene's test was also run in order to determine if the assumptions of homogenous variances was met. If

homogeneity was met an ANOVA would be sufficient in data analysis. If not, an ANCOVA was used. If ANCOVAs were used, data was analyzed to covary for pre-intervention scores in order to control for pre-intervention differences between participants.

Results from each of the 21 analyses related to underachieving gifted students' academic performance led the researcher to fail to reject the null hypothesis. These results could be due to activities in class that were not engaging. Baum et al., (1995) found that students identified as underachieving by their teachers showed academic performance when exposed to an activity that engaged them in investigating and solving a problem of their interest. If the class was not conducted to have activities that engaged the student, poor academic performance in underachieving gifted student could have been a result.

This research connects with the intrinsic value theme that was discussed in chapter four of this paper. Students will find value in the class if it nurtures an interest that they have. One gifted underachiever discussed how this ties in with performing in the class. Debbie, a non-gifted student, stated, "If you're interested in the subject then you'll like be more engaged and you want to know how to like complete each of the problems."

Another explanation for data that is not statistically significant could be due to the type of underachievers participating in the study. Figg, Rogers, McCormick, and Low (2012) discussed two types of underachievers, conventional and selective. According to Figg, et al. (2012):

> The conventional underachiever, is insecure about his ability to do well, cautious about pursuing new topics, and self-deprecating and self-critical about his academic ability. Whereas the selective consumer knows he is smart, knows he is capable of obtaining straight-As, and enjoys learning, yet participates only in work that is of interest because he knows school is not the only place where learning occurs. (p. 55)

If the underachievers in this study fell into one of the two groups then their ability to do well academically might have been altered.

Another explanation could be sociopsychological, family-related, and school related factors. Ford and Antoinette (1997) found that sociopsychological (poor or low self-esteem), family-related (parents having unreasonable expectations or not being involved in school progress), and school related factors (poor student-teacher interaction, lack of challenging to work or disinterest in school) can be linked to underachievement in students. If students in both groups were struggling with any of these factors then non-significance in the analysis might be shown.

If students involved in this study did not have the self-esteem to complete a rigorous course such as math analysis their grade could have suffered. Nicole, a non-gifted student, stated, “No matter how hard I try I can’t seem to *get* this class.” Frustration sometimes led to students giving up. One student started failing daily quizzes and gave up study for them all together. Austin, a non-gifted student, gave the excuse, “what does it matter? I’m going to fail this course anyway, so why even try?”

Family factors influenced one student's case. Part of the program was to reward the students when they met a goal they set for themselves. Jonathan, a gifted student, set the goal of doing his homework on time. When that goal was achieved he asked for his reward to be a call home in order to ask the parents to "ease up" on the student. When the researcher called the parent, the parent did not want to hear about the small goal that was accomplished, but yelled at the researcher since the student was holding a D in the course. The student did not get any punishment lifted and even though he set and accomplished a goal.

Research question three: How do underachieving non-gifted high school students who participate in a personal goal-setting intervention compare to their non-participating peers in terms of overall academic attitudes?

In order to determine the impact that personal goal-setting had on students from the intervention group, 35 analyses were run in order to compare academic attitudes of the control and experimental participants. As discussed previously, these analyses compared students in the intervention and control groups according to the following subscales of the SAAS-R. These subscales included: 1) Motivation and Self-Regulation, 2) Attitudes Towards Teachers and Class, 3) Goal Valuation, 4) Academic Self-Perception and 5) Attitudes Toward School, in gifted students involved in the intervention and those gifted students who were not participating. In the 34 analyses related to the subscales of the SAAS-R the researcher failed to reject the null hypothesis.

A reason for underachieving, non-gifted students not to be affected by a goal-setting program could be the classification of their underachievement. Dowdall and Colangelo (1982) have stated that underachievers can be classified as those students who

have the potential and predictability to achieve but are not achieving to their assumed potential. Students participating in the study elected to take a higher mathematics course which is only required for more advanced math students. These students had the potential to do well and were recommended by their teachers to take the course. This predictability of achievement might have been incorrect, and those student involved in the study might not have had success from the beginning. Frustrations were shared from the math analysis teacher as well. She pointed out that several students each year are placed in her class before they are ready to take such an advanced course. She also emphasized that in the pre-requisite course students were coddled and when they got to her class it was wake-up call to a more rigorous course.

Students also need to have positive attitudes in order to be successful in school. Clemmons (2005) studied the effects of student attitudes. He found that students need to have positive attitudes toward school in order to achieve academically. Positive attitudes in gifted students can also help them with their engagement in school. Some non-gifted underachievers, did not have had positive attitudes towards math analysis, and therefore were not successful in the class due to their attitude.

Research question four: How do underachieving non-gifted high school students who participated in a personal goal-setting intervention compare to their non-participating peers in terms of actual academic performance?

In order to determine the impact that personal goal-setting had on non-gifted underachieving students from the intervention group, analyses were run at three different intervals: 1) at the end of the 1st Interval (4 weeks into the study), 2) at the end of the 2nd Interval (8 weeks into the study, and 3) at the end of the 3rd Interval (12 weeks into the

study (Figure 1) As discussed previously, *t*-tests were conducted to determine whether statistically significant differences existed between the control and experimental groups at the beginning of the intervention with baseline data (1st Interval) and midpoint data (2nd Interval). In order to compare the control groups' academic performance to the experimental groups' academic performance, *t*-tests were used to compare the control group and experimental group at the 1st and 2nd Interval in order to determine if analyses of variance (ANOVA's) or analyses of covariance (ANCOVA's) were to be implemented. Levene's test was also run in order to determine if the assumptions of homogenous variances was met. If homogeneity was met an ANOVA would be sufficient in data analysis. If not, an ANCOVA was used. If ANCOVAs were used, data was analyzed to covary for pre-intervention scores in order to control for pre-intervention differences between participants.

Results from each of the 21 analyses related to underachieving non-gifted students' academic performance led the researcher to fail to reject the null hypothesis. Again these results could be due to activities in class that were not engaging. If the class was not conducted to have activities that engaged the student, poor academic performance in underachieving non-gifted student could have been a result.

One analyses was found to be statistically significant was academic performance from non-gifted students in the control group. These students, who did not receive the intervention, had better overall academic performance in the study [$F(1,18) = 11.89$, $p=.003$]. An explanation for this could be that there was only 1 non-gifted underachiever in the control group as compared to the 6 non-gifted underachievers in the experimental group. Since the sample size was low it is hard to trust the results of these findings.

If non-gifted students were not succeeding during the intervention receiving bad grades could have adversely affect their success in the class. Students who put effort in the class only to receive a C or a D were discouraged from doing their best on following assignments. Grades were also a big motivator for these students. Their definition of being successful in the class was passing with an A or a B letter grade. In several statements students described that grades were important to their success in math analysis instead of the learning that occurred throughout the course. William, a gifted student, shared that, "It is important to get good grades in order to have a basis for how hard you have to work." Another student discussed that it was important to keep track of progress using grades. Jennifer, a gifted student, told the researcher, "It is important to know your grade and what you have to do to improve." A student shared how her grades actually motivated her. Renee, a gifted student, stated, "Good grades are important. If I didn't know my grades I wouldn't have something to strive for in class. They motivate me."

Research question five: In what ways do participating students value a goal setting intervention as it relates to a higher level mathematics course? Results from the Exit Questionnaire - Revised show that the goal setting intervention was valued. When asked if they took the intervention implementation seriously, more than 80% of the participants responded that they did take the intervention seriously. According to the interviews about their enjoyment of goal setting, 90% of participants agreed they enjoyed setting goals, and over 80% would suggest the program to a friend. Students also shared that a goal-setting intervention would have long-lasting effects. When asked if they would set goals and work toward them in the future over 85% of the participants said they would.

One topic addressed in the Exit Questionnaire-Revised was that of setting goals for academic success. This topic had the greatest number of participants in agreement. When asked if setting goals would be helpful to their future, all participants agreed, and when asked if they agreed that setting goals would help them do better in school, over 85% of the participants felt that setting goals would help them academically.

Starting in week two students were asked to set goal centered on either the intrinsic, attainment or utility value. When the three values from the intervention sessions were discussed every participant understood how each could help with success. During week two 29 % of the students set goals around the utility value. These students felt if they thought beyond the goals of the classroom they would be successful in their future. These participants discussed college and how keeping those utility values in sight would help them stay on the right track. This value remained strong even after the first grading period. Even though their grades dropped students still created goals based around the utility value. In fact 27% of the students kept using the utility value to set goals.

This data shows that students should be exposed to future goals and how they are going to use school to get there and be successful. Students at this age can connect how future goals are influenced by what they do now. Having those conversations in class could prove to be worthwhile.

The intrinsic value was the most difficult for students to keep throughout the class. At the beginning of the study 26% of the students set intrinsic goals. When the 1st Interval came to an end and the grades became a reality only 1% of the students kept using the intrinsic goal for themselves. The rest of the students started setting attainment values in order to get their grades up.

When speaking to the participants it was hard for them to see the connection between math and connecting it to something of interest. By high school students have very specific interests and they shared that math was not one of them. The teacher did her best to make the class engaging. However these activities were short lived and the students weren't hooked by the subject matter.

The attainment value is important to students because this value gives them their identity in a given subject (Wigfield, 1994). At the beginning of the study 45% of the students found some alignment with this value. Students felt that if they could succeed in a higher level mathematics course it would make a type of math scholar. They felt if they did certain things it could help them attain this value.

Students who identified themselves with this value realized that an important characteristic to have was tenacity. As one student pointed out:

> I know I can do it I just have to work for that task or for that goal and so what I have to do is just put in the time and just work as hard as I can to reach that.

It was evident that students who held the attainment value in high regard identified their success in the class based on the grade they earned. As one student shared:

> Because I mean when you do poorly in a class your motivation goes down and I mean I think that like can affect you like not only just in that class but overall and if I do well in my class I think I will be a better student overall.

As some students started to receive failing grades the researcher saw the motivation for the class dissipate. Students were not finding themselves as math scholars and therefore did not start putting their best effort forward when working in this class. This was leading them to poor grades and underachievement.

At the second week 45% found value in setting attainment goals however by the end of the 1st Interval 73% of the students concentrated on attainment goals. This was due to the slip in their grades and the surprise of their first report period. Students didn't feel that the intrinsic value or utility value were important to concentrate on for the class. Most of the time when the researcher met with the students goals were set that centered around homework, getting work turned in on time or even getting work complete.

Many of the students discussed spending more time on studying for the assessments. Even though grades still weren't improving, many of the students discussed increasing the time they spent studying for math analysis. Quality versus quantity was discussed in the one on one sessions though most students felt that more time spent studying equaled a more scholarly student.

Students felt that the attainment value helped them succeed. Ryan, a gifted student, pointed out, "When you are able to believe in yourself, you know you can do it, and you had that confidence in what you can do in class, it can really help you succeed in the class." Janice, a non-gifted student, went on to explain, "When I have more confidence in myself I succeed in the class."

The attainment value is important for students to develop in any class. When they start thinking about themselves as scholarly and achieving in the subject then motivation goes up and success happens.

On the other hand as students identified with the attainment value their personal belief. They understood the class to be hard and though they were not getting a grade that they had hoped for they shared with the researcher they were proud of all staying with the class.

Though grades did not seem to significantly improve, the attitudes and how students shared them became scholarly and transferable to other subjects. As students began to believe in themselves as math scholars, they realized the skills they learned with goal setting could be used in other subjects. Mike, a gifted student, stated that as she learned the skills from the intervention it helped her realize that learning "revolves around preparation in a class so can you can understand it more." Max, a non-gifted student, pointed out that "when you set a goal you really do try to work for it. As I was setting goals for this I started setting goals in other classes."

Students seemed to grow in their understanding of the attainment value. They also realized that when another person is holding them to task it made them more conscientious of how they completed their goals. Several students pointed out that it was a pain to meet weekly with the researcher but those who complained were grateful for the extra support.

Other findings. Students learned how to use their time wisely when working through the program. As they worked through the intervention, students realized that time was a huge roadblock to their success. Many of these students had done well in school. Earning good grades could be obtained by these students with little or no effort; however, math analysis seemed to be the first class where students were exposed to content in which more time and higher level thinking needed to occur. Many students did not know how to schedule their time since more attention needed to be spent on math analysis. Balancing school life, home, and work proved to be a huge influence on the goal setting intervention. Renee, a gifted student, pointed out:

> I have problems mainly with studying and time management. I find it hard with my homework along with things that I have to do at school. Along with school and sports and other activities it is quite difficult. I have had to use time management to get all my work done**.**

Other students were not quite sure how to make the best choice when it came to time management. Abigail, a non-gifted student, described her situation:

> My roadblock is time management because I know I could manage my time better. I also think like when it comes to tutoring, and getting extra help, I think more like; 'will somebody be able to pick me up?' 'Is it even going to be beneficial if I go?' 'Should I go no matter what?' 'How am I going to get home?' 'Is this even going to be beneficial?' 'I should just go no matter what and then just like take the bus home'

One young man in the class said that if you don't have good time management it might hinder your progress. Gary, a non-gifted student, shared "If you don't manage your time then you will procrastinate which will cause you to fall behind and you don't really know what's going on in class."

Time management and keeping organized was a huge roadblock to student success. Assessments in math analysis kept students from earning the As and Bs that they were used to earning in the past. In one on one sessions students shared that in the past teachers would give practice problems that closely matched test problems. It is pertinent to teach bright kids how to manage time. Up until now bright kids have had to spend little time studying. There is always the one class that gifted students' face which

challenges them (Heacox, 1991). Even the students are telling us in this study that they need to have those skills in order to be successful.

Other students in the class felt that roadblocks for them were how they could balance other classes and the work they receive from them. Warren, a non-gifted student, stated, 'I think a roadblock would be if I have homework for another class." Hannah, a non-gifted student, added, "I think the roadblocks I have are like trying to balance the math and everything with my other subjects." Jacob, a gifted student, went on to further explain:

> Other classes will be in the way. You will have to shift your attention from the goal you have set in math analysis to like another class. I don't have a lot of time to spend looking over notes. If the teacher gives more homework than it is very hard for me to meet my goals.

Students today are involved in much more than they used to be. Sports, jobs, family duties can take a lot from them. Fitting homework in can be quite difficult. These young men and women need ways in which they can learn to survive as a millennial.

The final influence that was pertinent to goal setting was the role of the mentor in a goal-setting program. Throughout the results chapter the students mentioned how the researcher acted as a mentor. Mentors are important and could lead to success. Rubenstein, Siegle, Reis, McCoach, and Burton (2012) found that having a supportive adult or mentor may affect student success. This was also evident in the interviews. In one discussion a student shared the following:

> I'm usually a good student. I do my work but only the homework and studying for tests. Because I was doing this with you (the researcher) I was doing things I

> would not have done. Outside of class I was watching videos and working with people. To be honest I wouldn't have done that if I didn't have to meet with you every week.

When educators check in with underachieving students, they can help them succeed (Baum et al., 1995; Reis & McCoach, 2000). Other students said they learned how to be successful in the class based on the conversations that happened between mentor and student. Mark, a gifted student, stated, "I think the program was worthwhile by the progress that you showed me. I feel our discussions were beneficial in the long run grades because my grades raised significantly."

The goal-setting intervention interview turned out to be a teacher/student partnership. It organically grew into more of a counseling program. Fong, Snyder, Barr, and Patall (2014) found in their meta-analysis that counseling-based interventions were more effective for underachievers than interventions focusing only on curriculum. Students felt that the interaction between the researcher and themselves was beneficial. One student shared that conversations gave her confidence in the class. Hannah, a non-gifted student, stated, "I absolutely feel like goal-setting was worthwhile. I looked forward to talking to you because it made me feel better about my grade even if it wasn't that 'A'."

Elijah, a non-gifted student, summed up his experience with the researcher (mentor) after being asked if meeting weekly was helping him:

> Yeah, I know it did because usually I don't do what I need to do on time. Having to check in with you once a week kept me on my game which kept my grades up. If I didn't have to see you each week I'm not sure I would be this successful.

Implications

Results from the data show that when underachieving gifted high school students have a goal setting program, with a mentor to whom they report, positive academic self-perception happens. It would be beneficial to these types of students to have some sort of goal setting program in order to have them accountable to their own learning. Students who live in large suburban cities in schools with low to mid socioeconomic backgrounds could possibly benefit from a program such as this.

As Reis and McCoach's (2000) findings demonstrate, there is a correlation between positive academic self-perception and academic success. Reis and McCoach (2000) found that encouraging gifted students to work towards personal, motivating can help them both with school and life, in general. As students are exposed to strategies to help them with self-perception they might also find academic success. It is important to find ways to help students develop this part of their academic profile. Goal-setting is one way that this can be accomplished.

Another implication to be noted is the importance of a mentor. Students will respond to an adult in their life who meets with them in order to hold them accountable for goals that have been set. These mentors can be anyone from a teacher to a community member to a parent in their life. Clemmons (2005) found a strong correlation between positive attitudes toward school and parental involvement. Parents or influential adults can be strong motivators when supporting student success. It is, therefore, important that underachieving students had these mentors in their lives to support their success.

Positive attitudes towards math happened in this setting. Because of this it is important to provide students, especially in math, with opportunities to improve their

self-concept. Students, who have a positive attributional style, or the belief that they can be successful in math, are more likely to have a stronger belief in their mathematics and verbal ability (Clemmons, 2005). If students are provided with the strategies that help them with self-concept it would help both identified gifted students as well as those not identified for gifted programs.

A goal-setting program is important to any student but especially to underachievers. If this program employs ways for students to connect with mentors who have strategies to help students with setting goals, evaluating them, adjusting them, and rewarding them, there could be fewer underachievers in the educational setting.

Finding the right intervention for underachievers can be an all-encompassing endeavor. Recommending school-wide programs to a large school system could be a future implication as the research continues in the area if underachievement. Special committees to implement different interventions could be sent by school systems in order to investigate this on a larger scale. Principals could help support this program by enlisted gifted teachers to use current research in order to find intervention for the populations in their own schools.

Secondary schools, such as colleges, can start teaching about the uniqueness of gifted students and how to handle these students in a regular classroom. By using the current research on gifted underachievement future teachers can brainstorm ways to implement their own ideas. When many agencies are enlisted to help solve the problem of gifted underachievement, the problem itself seems quite easy to fix.

Limitations

Threats to internal validity include maturation since the first measure was taken four weeks into a math analysis class. As students become comfortable with the teacher's style and the logistics of class they adapted to the environment and eventually succeeded based on their maturation in math analysis.

The Hawthorne effect impacted the study's findings' internal validity due to the fact that the students in the experimental group were trying to support a positive outcome for the researcher and the findings of the study. During one administration of a testing instrument William, a gifted student, called out to the researcher the following, "I should be answering 'almost always', shouldn't I? That way your study will be successful." to occur. The researcher directed the student to answer the questions honestly.

Another threat to internal validity was a diffusion of treatment since both group were taught by the same teacher. The teacher was trained in the intervention and though she may have consciously thought she was only delivering the intervention to the experimental group, the control group may have benefitted from her knowledge.

Some threats to external validity to be considered is population validity. The students who participated in the study are in a very specific advanced math class. Ecological validity is considered since these students are from a certain population in a large school system. Due to this threat findings can only be generalized to a specific population.

Since the sample was small the assumption of normality of distribution associated with the ANCOVA procedures may have been inadvertently violated.

To address these threats, the setting was controlled as much as possible. Random assignment was used to select the two groups for the study. The same math teacher taught both math classes. The same gifted resource teacher (researcher) worked with both groups during the intervention by giving the pre- and post-test to both groups, collecting the data from both groups, and administering the treatment to the experimental group. Both groups were assigned to this math class at the exact time on altering days. Each group also had lunch worked into their math class at the same time. Both the math analysis and researcher (gifted resource teacher) were trained to give questionnaires and tests. Incentives were planned for participants and participants responded favorably to them.

Recommendations for Future Research

Replicating an intervention for different populations of underachieving gifted students is naturally difficult. The goal-setting intervention required that students meet with a mentor for 15-20 minutes per week. Finding school systems, schools, and teachers willing to give that amount of instructional time to a program could prove to be non-existent. However, it is important for this type of research to be done in order determine if there is one or several strategies to be used when working with underachievement. Further research could happen if several researcher replicated this study in a couple of high schools. Since academic self-perception had statistical significance, starting with that could be the cornerstone to research in high schools. Finding interventions that work, conducting the research, and sharing the results will help the field of gifted education.

Though there are many reasons why gifted students underachieve (Heacox, 1991; Mandel & Marcus, 1995; Rimm, 2003; Siegle & McCoach, 2005) merit should be given

to finding interventions which help different types of underachievers. Rubenstein et al. (2012) examined five interventions to help underachievement. From those five, one emerged as showing the most benefit for helping with underachievement, goal valuation. When replicated at the high school level gifted underachievers in an advanced mathematics class responded favorable to the intervention by having increased academic self-perceptions. Other findings from the study had all students exposed to a goal valuation intervention appreciating the process and responding favorably to the program as a whole.

Future studies might concentrate on creating goal valuation interventions that are specifically focused on academic self-perception. Currently studies are finding that underachieving gifted students at the high school also underachieve in college. Baslanti and McCoach (2006) found students underachieve in college. These students had low academic self-perception and poor attitudes toward teachers and school, as well as little goal valuation, motivation, and self-regulation. In order to reverse beliefs about these particular areas, studies could be designed in order to reverse a learner's belief about his or her thinking. These studies could be longitudinal in which students receive interventional programs through their high school and then college academic years. Comparisons could be made to determine if there is a correlation between an intervention program that starts at high school and finishes in college.

This intervention was used with very specific students in a specific location. Future studies could include rural areas, different classes, big cities, or any population that offers other information on the intervention. It would also be beneficial for this research to include large sample sizes.

Future Recommendations Based on Added Data

This section discusses what has occurred since the research ended. Pertinent thoughts from students in the control group will be shared and new discoveries will be addressed. Ideas for continued research will also be included.

During the latter part of March, leading up to the 3rd quarter report card, students who were part of the control group began to reflect more about the math analysis class. Lunchtime exchanges in the gifted room, found students complaining about the difficulties of class. Math, which used to be an enjoyable class for these students, had now become a class they no longer looked forward to in their daily schedule. The 3rd quarter grading period found students getting angry and in some instances giving up.

The researcher discussed these observations with the students. The students shared that they easily grasped the subject matter throughout the study during the 1st semester. At this time these students were not complainers; however, they were now vocal about the class and the teacher's style. When asked about the change in attitude one student replied, "Something has changed in the class. In the past it was fun and interesting. The teacher told stories and was funny. Now it is going too fast. There is no time for that anymore." Another student agreed explaining, "She is still funny but the class isn't fun anymore."

Students were asked to discuss how they were doing in the class. All seven of the students had no idea what they were going to earn on their report card. Five of the seven students felt that they had dropped in their grade. One student, who had received nothing lower than an A in math since first grade, stated, "I'm doing terrible in this class. At the beginning of the year I wanted to make an A. Right now I just want to get out." Other students shared they were looking forward to AP Calculus which they will take as their

next required math. When asked to explain their excitement about this higher level course most shared they heard the class was easier and that the teacher was better. After a few more probing questions one student shared, “Well I’m not sure the class is easier, but we have heard the teacher isn’t as hard.”

A new theme, which seemed to emerge from this discussion, was that students connected their feelings of a class to how they felt about their teacher. As previously discussed in the theoretical framework, students need to be confident in their ability to perform a task and have the expectation to succeed. These two values seemed to falter during the 3rd quarter. At the beginning of the year the students enjoyed the teacher and the class. As the year progressed the students felt that class became more difficult, the teacher expected more, and they were held to a higher standard. All these components could have influenced this particular group in their feelings about the teacher and the class.

The researcher then reminded the students about the goal-setting intervention that had been conducted the previous semester. Students were asked to share their thoughts about participating in a goal-setting intervention. In particular, the students were asked if they thought they would have been more successful during the 3rd quarter if the intervention had continued. One student said, “I don’t think that would have made a difference.” He then paused and added, “You know if I had another adult to set goals with it might have helped.” Another student asked if the intervention included ways to study and set goals. When the students were told it did, six of the seven students all agreed that they felt an intervention like that would have helped. One student explained

her frustration, “I know the math but I’m terrible at studying it. If I had help with that I definitely would have done better.”

The recent discussion led the researcher to the idea that either holding the intervention longer or giving it to the other group could have provided insightful ideas. Further investigations could prove to add much to the current study.

Summary and Conclusions

Researchers (Dowdall & Colangelo, 1982; Fie & Pitts, 1980; Gallagher, 1991) have emphasized that gifted underachievers are more than smart children bored with school. There are implications when gifted children, or any learner, do not work to their potential. The loss of what these learners could eventually give to society could be devastating.

By focusing on what we know, what has been discovered in literature and through empirical research, finding interventions to help underachievers could be a step in the right direction. Further explorations of the effectiveness of interventions for underachieving gifted students and those not identified as gifted will help teachers and those who make school policy focus their efforts, which in turn can improve the likelihood for all learners to achieve to their full potential.

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Appendix A

INFORMED CONSENT DOCUMENT

PROJECT TITLE: Investigating an intervention used to address underachievement in gifted and non-gifted high school students: A mixed methodological study.

INTRODUCTION

The purposes of this form are to give you information that may affect your decision whether to say YES or NO to your child's participation in this research, and to record the consent of those who say YES. This mixed method study's purpose is to determine whether a goal-setting intervention impacts student grades and attitudes in a math analysis class.

RESEARCHERS

Dr. Peter Baker, Principal Investigator
Old Dominion University
Teaching & Learning
(757) 683-5820

Investigators:
Miss Missy Sullivan, Doctoral Student
Old Dominion University
Teaching & Learning
(757) 477-6994

DESCRIPTION OF RESEARCH STUDY

Several studies have been conducted looking at intervention strategies reversing underachievement in gifted and non-gifted students, but little research has been done to look at these strategies at the high school level. This study will provide goal-setting strategies to a group of students in math analysis in order to determine progress within the class.

If you decide to allow your child to participate, and the student agrees as well, then the student will join a study involving research which determines if goal-setting helps with academic achievement and attitude. If both you and your child say YES, then the student's participation will last for a period of nine weeks. Approximately fifty students will be participating in this study.

One class will be determined as the intervention group, and one will be the control group. BOTH groups will receive the same math analysis curriculum, assignments, and assessments. BOTH groups of students will also receive the same amount of outside help from the teacher as needed. The intervention group will receive additional components to their math analysis program.

Each child has an equal chance of being selected for the intervention group. If your child is selected for the intervention they will receive goal-setting strategies in their math class as well as work with the gifted resource teacher for ten to fifteen minutes outside of class. The sessions with the gifted resource teacher will have students learning learn their own strategies for setting goals. If your child is selected for the intervention group, and they are scheduled for a study block, they will meet with the gifted resource teacher during that time to share their perceptions of the goal-setting strategy.

If your child is not selected for the initial study, and the intervention proves to be successful, then your child will have the opportunity to receive the intervention as well later in the school year.

EXCLUSIONARY CRITERIA

Your child should have completed all required courses in order to be enrolled in math analysis. To the best of your knowledge, you should not have any conflict of interests that would keep your child from participating in this study.

RISKS AND BENEFITS

RISKS: This study is part of a dissertation and will be published. If you decide to have your child participate in this study, then they may face a risk of discussing potentially uncomfortable topics with complete honesty. The researcher tried to reduce these risks by allowing each participant to choose not to answer any question that they do not feel they can answer comfortably or honestly. And, as with any research, there is some possibility that you may be subject to risks that have not yet been identified.
BENEFITS: The goal-setting intervention could prove to help your child be successful in this class.

COSTS AND PAYMENTS

The researchers are unable to give you any payment or other compensation for participating in this study.

NEW INFORMATION

If the researchers find new information during this study that would reasonably change your decision about participating, then they will give it to you.

CONFIDENTIALITY

Researchers in the study will have access to your child's demographics, grades, and surveys they complete throughout the study. Students who are randomly selected for the intervention will also fill out goal-setting forms, complete an exit questionnaire, and be interviewed about the perceptions of the study (if they are enrolled in a study block).

The researchers will take reasonable steps to keep private information, such as identifying information confidential. The results of this study may be used in reports, presentations, and publications, but the researcher will not identify the students. Though information will remain confidential there may be cases where information needs to be shared with others. If the researchers learn information that they must legally report (i.e.,

abuse, self-harm, etc.) legally this will need to be shared. Records may be subpoenaed by court order or inspected by government bodies with oversight authority.

WITHDRAWAL PRIVILEGE

It is OK for you to say NO. Even if you say YES now, you are free to say NO later, and walk away or withdraw from the study -- at any time. The researchers reserve the right to withdraw your participation in this study, at any time, if they observe potential problems with your continued participation.

COMPENSATION FOR ILLNESS AND INJURY

If you say YES, then your consent in this document does not waive any of your legal rights. However, in the event of harm arising from this study, neither Old Dominion University nor the researchers are able to give you any money, insurance coverage, free medical care, or any other compensation for such injury. In the event that you suffer injury as a result of participation in any research project, you may contact Dr. Peter Baker (757) 683-5820 or Dr. Ed Gomez the current IRB chair at 757-683-4520 at Old Dominion University, or the Old Dominion University Office of Research at 757-683-3460 who will be glad to review the matter with you.

VOLUNTARY CONSENT

By signing this form, you are saying several things. You are saying that you have read this form or have had it read to you, that you are satisfied that you understand this form, the research study, and its risks and benefits. The researchers should have answered any questions you may have had about the research. If you have any questions later on, then the researchers should be able to answer them:

Dr. Peter Baker, Principal Investigator
Old Dominion University
Teaching and Learning
(757) 683-5820
Investigators:
Miss Missy Sullivan, Doctoral Student
Old Dominion University
Teaching and Learning
(757) 477-6994

If at any time you feel pressured to participate, or if you have any questions about your rights or this form, then you should call Dr. Ed Gomez the current IRB chair, at 757-683-4520, or the Old Dominion University Office of Research, at 757-683-3460.

And importantly, by signing below, you are telling the researcher YES, that you agree to participate in this study. The researcher should give you a copy of this form for your records.

Subject's Printed Name & Signature	**Date**
Parent's Printed Name & Signature	**Date**

INVESTIGATOR'S STATEMENT

I certify that I have explained to this subject the nature and purpose of this research, including benefits, risks, costs, and any experimental procedures. I have described the rights and protections afforded to human subjects and have done nothing to pressure, coerce, or falsely entice this subject into participating. I am aware of my obligations under state and federal laws, and promise compliance. I have answered the subject's questions and have encouraged him/her to ask additional questions at any time during the course of this study. I have witnessed the above signature(s) on this consent form.

Investigator's Printed Name & Signature	**Date**

Appendix B
Student Assent Form – Goal Setting Intervention Study

My name is Missy Sullivan and I am a doctoral candidate at Old Dominion University.

I am asking you to take part in a research study because I am trying to determine if a goal-intervention program will help with improving math attitudes and grades.

If you agree, you will be asked to participate in nine weekly goal-setting sessions that last no longer than 10 minutes. Though these sessions will take place during your math or study block class they will not require any additional work to be done at home. If you have a study block class you may also be asked to take part in an additional session where you will be asked about your reactions to the goal-setting intervention.

You do not have to be in this study. No one will be mad at you if you decide not to do this study. Even if you start, you can stop later if you want. You may ask questions about the study.

If you decide to be in the study I will not tell anyone else what you say or do in the study. Even if your parents or teachers ask, I will not tell them about what you say or do in the study.

Signing here means that you have read this form or have had it read to you and that you are willing to be in this study.

Signature of subject_____

Subject's printed name _____

Signature of investigator_____

Date_____

Appendix C
Participant Consent Form – Math Analysis Teacher

Investigating an Intervention Used to Address Underachievement in Gifted and Non-Gifted High School Students: A Mixed Methodological Study

The purpose of the study:
Several studies have been conducted looking at intervention strategies reversing underachievement in gifted students, but little research has been done to look at these strategies and high school students. You have been selected to be a part of this research project to determine if a tested goal-setting intervention will work with underachieving mathematics students.

Expectations for participants:
The Gifted Resource Teacher (GRT) will:

1) Determine underachievement in the class. This will be done by examining grades from the first progress report.
2) Administer the pre-test (School Attitude Assessment Survey-Revised) to both the intervention and control groups.
3) Meet weekly with all intervention students, during their math analysis or study block, to plan goal-setting strategies.
4) Meet weekly with a smaller group of students, during their study block, to interview students about their perceptions of a goal-setting intervention. These meetings will be transcribed for qualitative purposes by the GRT.
5) Analyze grades to determine academic progress.
6) Administer the post-test (School Attitude Assessment Survey-Revised) to both the intervention and control groups.
7) Administer the Exit Questionnaire Revised to the intervention group.
8) Share findings with the math analysis teacher.
9) Provide necessary support for the math analysis teacher.

The Math Analysis teacher will:

1) View the necessary videos, review the intervention website, and become familiar with the tools of the intervention 8-10 weeks before the intervention begins.
2) Teach the math analysis curriculum in the same manner to both the control and experimental group.
3) Provide support (i.e., study sessions afterschool or during study block) when necessary
4) Provide the same assignments and assessments to both the control and experimental group.
5) Use goal-setting strategies throughout the nine week intervention. These will be recorded weekly on the *Daily Strategy Report* that will be given to the GRT.
6) Work with the GRT as necessary for implementation of the intervention.

RISKS AND BENEFITS

RISKS: This study is part of a dissertation and will be published. If you decide to participate in this study, then you may face a risk of discussing potentially uncomfortable topics with complete honesty. The researcher will try to reduce these risks by allowing you to choose not to answer any question that you do not feel you can answer comfortably or honestly. And, as with any research, there is some possibility that you may be subject to risks that have not yet been identified.

BENEFITS: The goal-setting intervention could prove to helpful in working with underachieving students.

COSTS/PAYMENTS

The researchers are unable to give you any payment or other compensation for participating in this study.

CONFIDENTIALITY

The researcher will take reasonable steps to keep private information, such as identifying information confidential. The results of this study may be used in reports, presentations, and publications, but the researcher will not identify you. Though information will remain confidential there may be cases where information needs to be shared with others. If the researchers learn information that they must legally report (i.e., abuse, self-harm, etc.) legally this will need to be shared. Records may be subpoenaed by court order or inspected by government bodies with oversight authority.

WITHDRAWAL PRIVILEGE

It is OK for you to say NO. Even if you say YES now, you are free to say NO later, and walk away or withdraw from the study -- at any time. The researcher reserves the right to withdraw your participation in this study, at any time, if they observe potential problems with your continued participation.

VOLUNTARY CONSENT

By signing this form, you are saying several things. You are saying that you have read this form or have had it read to you, that you are satisfied that you understand this form, the research study, and its risks and benefits. The researcher should have answered any questions you may have had about the research. If you have any questions later on, then the researcher should be able to answer them:

Dr. Peter Baker, Principal Investigator
Old Dominion University
Teaching and Learning
(757) 683-5820

Investigators:
Miss Missy Sullivan, Doctoral Student
Old Dominion University
Teaching and Learning
757-477-6994

Signature of subject_____

Subject's printed name _____

Signature of investigator_____

Date_____

Appendix D
Interview Questions for Participating Students

WEEK 2 QUESTION: What learning skills do you think are important when you assess how you are as a student?

Probe question: Explain why you think it is important or not important to assess how you are as a learner.

WEEK 3 QUESTION: Do you think it is more important to increase interest value, utility value, or identify value when goal setting?

Probe question: Please explain why you chose that particular value.

WEEK 4 QUESTION: What do you think are your major roadblock(s) when participating in a goal-setting program?

Probe question: Why do you feel that (those) are your major roadblocks?

WEEK 5 QUESTION: What short term and long term goals are worthwhile to identify when participating in this goal-setting program.

Probe question: Please explain why it is (or isn't) worthwhile to set those types of goals.

WEEK 6 QUESTION: How will knowing what you want to do in the future help you with goal-setting?

Probe question: Please explain why you think this is (or is not) important in the goal-setting process.

WEEK 7 QUESTION: What characteristics do you think someone who doesn't do well in school displays?

Probe question: How could goal-setting help someone who doesn't do well in school?

WEEK 8 QUESTION: Explain why you think it is (or is not) important to know what your current grade is in a class to help with achievement?

Probe question: How can you find ways to check your grades?

WEEK 9 QUESTION: Explain if you feel (or don't feel) that this this goal-setting intervention was worthwhile?

Probe question: Please explain how this intervention help (or hindered) your progress in this class.

Appendix E
Week One Conference Worksheet

Directions: Please complete all of the following sentences regarding the class that you are focusing on for this program. There are no right or wrong answers. Put down the first idea that comes into your head. When you are done, give this form back to your teacher/counselor.

1. When I try hard in this class, it's because _____.
2. I would spend more time on my schoolwork if _____.
3. If I do poorly in this class, then _____ (will happen).
4. When I don't try hard in this class, it's because _____.
5. Doing well in this class will help me to _____.
6. This class is important because _____.
7. The thing that I am most interested in learning more about is _____.
8. The most interesting thing that I learned in _____ class this year is _____.
9. I feel best about myself when _____.
10. I feel worst about myself when _____.
11. I am most proud of _____.
12. I wish that I could _____.
13. When I grow up, I want to _____.
14. I really value _____.

Appendix F
Week Two Conference Worksheet

Discuss the answers to the Goal Value Exploration sheet of sentence completions from session 1. Use the following guiding questions and your analysis of their responses:

1. Look for patterns within the responses on the Goal Value Exploration worksheet.
   Does the student seem to have high or low interest in the class?
   Does the student seem to perceive the class as having high or low utility for him/her?

2. What things do interest the student?
   What does the student value?
   Where does the student put forth effort?
   How could some of that enthusiasm be channeled into school?

Additional Questions For Discussion:

1. Are you doing as well in this class as you could?

_____

_____

_____

_____

2. Are you doing as well in this class as you would like to?

_____

_____

_____

_____

3. When do you put forth the most effort to do well in school?

_____

_____

4. What do you find interesting about this class?

5. How is the class useful to you now?

6. How will the class be useful to you in the future?

Appendix G
Week Three Conference Worksheet

Note to the teacher/counselor: Remember, there are four reasons that students find value in a class.

1. Intrinsic Value/ Interest: They are interested in the topic or enjoy the way it is presented/the work that they do in class.

2. Utility/Usefulness: They find the information or skills they are learning useful, or they believe that they will be useful in the future.

3. Attainment Value/Personal Identity: Learning the material or doing well in the class is important to their conception of who they are as a person.

4. Cost: The cost of doing poorly in the class is too great.

- Talk to the student about how he/she perceives his/ her interest, utility, identity values, as well as the costs of achieving and the costs of failing the course. Connect his/her responses to your analysis of the student's goal value exploration worksheet for session 1. (Note: in our experience, some students, especially younger students will have a hard time relating to the "attainment value" and "cost" ideas. If those concepts don't seem to make sense or generate discussion for your student, you can feel free to confine your discussions to utility and interest. Think of UTILITY and INTEREST as essential components of the intervention and attainment/identity and cost as OPTIONAL components of the intervention).
- Ask the student to explain which of the task values he/she thinks is most important and why.
- Ask the student to brainstorm ways that he/she could increase the value of class. Record all of his/her ideas below.

Ideas for increasing the Interest Value of Math Analysis Class:

_____

_____

_____

_____

_____

_____

_____

Ideas for increasing the Utility Value of Math Analysis Class:

Ideas for increasing the Identity Value of Math Analysis Class:

Ideas for increasing the cost of doing poorly or decreasing the cost of doing well.

Discuss how you and/or the student might realistically incorporate at least one of the better ideas into class.

Appendix H
Week Four Conference Worksheet

Last week, you and the student discussed how you both might realistically incorporate at least one of the better "task value" ideas into class. Begin this session by evaluating the effectiveness of this strategy.

Were you and/or the student able to incorporate this idea into class?

If not, why not?

If so, how did it work?

Is there anything that you can do to make it work better?

Review the list of ideas from session 3.

Are there any other ideas from the list that you want to try?

How will you implement these ideas into class?

How and when will you next evaluate the effectiveness of the implemented ideas from last session and this session?

Appendix I

Week Five Conference Worksheet

1. What is one area of your class performance that you really want to improve? (This is your long term goal. It may take you several weeks, months, or even a whole school year to improve this goal.)

This goal is important to me because

2. What is one thing that you can do NOW to help you reach your long-term goal? (This is your short-term goal. You should be able to accomplish this goal in 2-4 weeks.)

3. What steps do you need to reach your short-term goal?

4. What things or people might keep you from reaching your goal? These are your obstacles.

5. What can you do to get around your obstacles? These are your solutions.

6. What special materials or help do you need to reach your goal? These are your resources.

7. How will you reward yourself when you achieve your goal? These are your incentives.

8. How and when will you check on your progress toward your goal? Who will help you to check on your progress?

Checkpoint 1 Date: _____

Checkpoint 2 Date: _____

I am committed to working toward achieving my short term goal and my long-term goal.

Student's signature: _____

Today's date: _____

Witness (Teacher's) signature: _____

Appendix J
Week Six Conference Worksheet

Goal discussion: It is important to discuss the student's goals for his/her academic career.

Discuss the following questions:

1. Describe what you think that your life will be like 10 years from now. (Tell the student to feel free to Dream Big, but to also be realistic.)

_____

_____

_____

2. How will you get there from here? What will it take to get where you want to go from here?

_____

_____

_____

3. Have the student brainstorm his or her long term goals.

_____

_____

_____

4. What steps must you take to achieve your long term goals?

_____

_____

_____

5. What things could keep you from achieving your long term goals?

6. How can you get a head start toward achieving your long term goals now?

7. How does this class (or school) fit into achieving your long term goals?

Re-explore utility, attainment, and interest values for the class in question.

1. What was the most interesting thing that you learned in class this week?
2. How can you make class more interesting for yourself?
3. What was the most useful thing that you learned in class this week?
4. How can you make class more useful to you?
5. What accomplishment from class are you most proud of?
6. What can you do to feel even better about yourself in class?

Review whether the strategies that you and the student developed during session 3 for increasing the task value of the class are working, and make any necessary modifications.

MODIFICATIONS to Strategies from session 3:

Ideas for increasing the Interest Value of Math Analysis Class:

Ideas for increasing the Utility Value of Math Analysis Class:

Ideas for increasing the Identity Value of Math Analysis Class:

Ideas for increasing the cost of doing poorly or decreasing the cost of doing well.

Can you and/or the student might realistically incorporate any of these ideas into class or school?

Closing:

- Give the student the opportunity to talk freely about anything class related that might be on his or her mind.
- You and the student should close by summarizing what the student accomplished between last week and this week, and what the student will try to accomplish between this week and next week.
- Call attention to any progress or positive steps that the student has made. Also mention any areas that continue to need attention, and relate those areas to the students stated goals.

This week's accomplishments:

Next week's goals:

Progress or positive steps:

Areas that continue to need attention:

Appendix K
Week Seven Conference Worksheet

Thinking about the consequences of underachievement (From Vernon, 2002).

In this activity, we are going to create a mock underachievement chain reaction.

Materials: 15 strips of paper; A stapler; A pencil

Procedure:

1. Have the student take a strip of paper, identify one consequence of underachieving, and put a number one on that strip.
2. Have the student take a second strip, and identify a consequence that could happen as a result of the first consequence.
3. Follow the same procedure until the student has completed all 15 paper strips.
4. Discuss the consequences listed on each of the rinds of the chain.
5. Have the student staple each of the papers into a circle and interconnect 1 with 2, 2 with 3, etc. so that he/she makes a paper chain out of the 15 paper strips.
6. Talk about the wisdom of beginning a chain of underachievement. Have the student take the paper chain home to as a reminder that today's actions have a ripple effect and have real consequences on the future.

2. Review whether the strategies that you and the student developed for increasing the task value of the class are working, and make any necessary modifications.

MODIFICATIONS to Strategies from session 3:

Ideas for increasing the Interest Value of Math Analysis Class:

_____

_____

Ideas for increasing the Utility Value of Math Analysis Class:

_____

_____

Ideas for increasing the Identity Value of Math Analysis Class:

_____

Ideas for increasing the cost of doing poorly or decreasing the cost of doing well.

Can you and/or the student might realistically incorporate any of these ideas into class or school?

Closing:

- Give the student the opportunity to talk freely about anything class related that might be on his or her mind.
- You and the student should close by summarizing what the student accomplished between last week and this week, and what the student will try to accomplish between this week and next week.
- Call attention to any progress or positive steps that the student has made. Also mention any areas that continue to need attention, and relate those areas to the students stated goals.

This week's accomplishments:

Next week's goals:

Progress or positive steps:

Areas that continue to need attention:

Appendix L
Week Eight Conference Worksheet

Weekly routines: Now, we will get into a pattern of routines for the remaining individual conferences.

1. **Rate your week** (Based on Wilde, 1995): Ask the student to rate her school-week on a scale from 1-10, with 1 being very poor, and 10 being outstanding. Then ask him/her to explain why she rated the week the way that he/she did.

Week 8 Rating: _____

Reason:

_____

_____

2. Self-Evaluation of Achievement

How do you think that you are doing in class?

_____

What is your current grade in the class? (How do you know?)

_____

Often, students do not know their grades in a given class. They simply don't keep track, and so they always report that they are doing "well". Now is an excellent time to show the student how to keep track of class grades and work out some sort of system so that the student can keep track of his or her own grades in the future.

Re-explore utility, attainment, and interest values for the class.

1. What was the most interesting thing that you learned in class this week?

_____

_____

2. How can you make class more interesting for yourself?

_____

3. What was the most useful thing that you learned in class this week?

4. How can you make class more useful to you?

5. What accomplishment from class are you most proud of?

6. What can you do to feel even better about yourself in class?

Review whether the strategies that you and the student developed for increasing the task value of the class during sessions 3 and 7are working, and make any necessary modifications.

MODIFICATIONS to Strategies from session 3:

Ideas for increasing the Interest Value of Math Analysis Class:

Ideas for increasing the Utility Value of Math Analysis Class:

Ideas for increasing the Identity Value of Math Analysis Class Class:

Ideas for increasing the cost of doing poorly or decreasing the cost of doing well.

Can you and/or the student might realistically incorporate any of these ideas into class or school?

5. Closing:

- Give the student the opportunity to talk freely about anything class related that might be on his or her mind.
- You and the student should close by summarizing what the student accomplished between last week and this week, and what the student will try to accomplish between this week and next week.
- Call attention to any progress or positive steps that the student has made. Also mention any areas that continue to need attention, and relate those areas to the students stated goals.

Appendix M
Week Nine Conference Worksheet

Rate your week (Based on Wilde, 1995): Ask the student to rate her school-week on a scale from 1-10, with 1 being very poor, and 10 being outstanding. Then ask him/her to explain why she rated the week the way that he/she did.

Week 9 Rating: _____

Reason:

_____

_____

_____

2. Self-Evaluation of Achievement

How do you think that you are doing in class?

_____

What is your current grade in the class? (How do you know?)

_____

3. Re-explore utility, attainment, and interest values for the class.

What was the most interesting thing that you learned in class this week?

_____

_____

How can you make class more interesting for yourself?

_____

_____

What was the most useful thing that you learned in class this week?

_____

How can you make class more useful to you?

What accomplishment from class are you most proud of?

What can you do to feel even better about yourself in class?

Review whether the strategies that you and the student developed for increasing the task value of the class during session 3, 7 and 8 are working, and make any necessary modifications.

MODIFICATIONS to Strategies from session 3:

Ideas for increasing the Interest Value of Math Analysis Class:

Ideas for increasing the Utility Value of Math Analysis Class:

Ideas for increasing the Identity Value of Math Analysis Class:

Ideas for increasing the cost of doing poorly or decreasing the cost of doing well.

Can you and/or the student might realistically incorporate any of these ideas into class or school?

5. Closing:

- Give the student the opportunity to talk freely about anything class related that might be on his or her mind.
- You and the student should close by summarizing what the student accomplished between last week and this week, and what the student will try to accomplish between this week and next week.
- Call attention to any progress or positive steps that the student has made. Also mention any areas that continue to need attention, and relate those areas to the students stated goals.

This week's accomplishments:

Next week's goals:

Progress or positive steps:

Areas that continue to need attention:

Appendix N

SCHOOL ATTITUDE ASSESSMENT SURVEY – REVISED

<u>Directions</u>: Please rate how strongly you agree with the following statements. In answering each question, use a range of (1) to (7), where (1) stands for strongly disagree and (7) stands for strongly agree. Please mark only one choice per question.

	Strongly Disagree (1)	*Disagree (2)*	*Slightly Disagree (3)*	*Neither Agree nor Disagree (4)*	*Slightly Agree (5)*	*Agree (6)*	*Strongly Agree (7)*
1. My classes are interesting.	O	O	O	O	O	O	O
2. I am intelligent.	O	O	O	O	O	O	O
3. I can learn new ideas quickly at school.	O	O	O	O	O	O	O
4. I check my assignments before I turn them in.	O	O	O	O	O	O	O
5. I am smart in school.	O	O	O	O	O	O	O
6. I am glad that I go to this school.	O	O	O	O	O	O	O
7. This is a good school.	O	O	O	O	O	O	O
8. I work hard at school.	O	O	O	O	O	O	O

	Strongly Disagree (1)	*Disagree (2)*	*Slightly Disagree (3)*	*Neither Agree nor Disagree (4)*	*Slightly Agree (5)*	*Agree (6)*	*Strongly Agree (7)*
9. I relate well to my teachers.	O	O	O	O	O	O	O
10. I am self-motivated to do my schoolwork.	O	O	O	O	O	O	O
11. I am good at learning new things at school.	O	O	O	O	O	O	O
12. This school is a good match for me.	O	O	O	O	O	O	O
13. School is easy for me.	O	O	O	O	O	O	O
14. I like my teachers.	O	O	O	O	O	O	O
15. I want to get good grades in school.	O	O	O	O	O	O	O
16. My teachers make learning interesting.	O	O	O	O	O	O	O
17. My teachers care about me.	O	O	O	O	O	O	O

	Strongly Disagree (1)	*Disagree (2)*	*Slightly Disagree (3)*	*Neither Agree nor Disagree (4)*	*Slightly Agree (5)*	*Agree (6)*	*Strongly Agree (7)*
18. Doing well in school is important for my future career goals.	O	O	O	O	O	O	O
19. I like this school.	O	O	O	O	O	O	O
20. I can grasp complex concepts at school.	O	O	O	O	O	O	O
21. Doing well in school is one of my goals	O	O	O	O	O	O	O
22. I am capable of getting straight As	O	O	O	O	O	O	O
23. I am proud of this school.	O	O	O	O	O	O	O
24. I complete my schoolwork regularly.	O	O	O	O	O	O	O
25. It's important to get good grades in school.	O	O	O	O	O	O	O

	Strongly Disagree (1)	*Disagree (2)*	*Slightly Disagree (3)*	*Neither Agree nor Disagree (4)*	*Slightly Agree (5)*	*Agree (6)*	*Strongly Agree (7)*
26. I am organized about my schoolwork.	O	O	O	O	O	O	O
27. I use a variety of strategies to learn new material.	O	O	O	O	O	O	O
28. I want to do my best in school.	O	O	O	O	O	O	O
29. It is important to me to do well in school.	O	O	O	O	O	O	O
30. I spend a lot of time on my schoolwork.	O	O	O	O	O	O	O
31. Most of the teachers at this school are good teachers.	O	O	O	O	O	O	O
32. I am a responsible student.	O	O	O	O	O	O	O
33. I put a lot of effort into my schoolwork.	O	O	O	O	O	O	O
34. I like my classes.	O	O	O	O	O	O	O

	Strongly Disagree (1)	*Disagree (2)*	*Slightly Disagree (3)*	*Neither Agree nor Disagree (4)*	*Slightly Agree (5)*	*Agree (6)*	*Strongly Agree (7)*
35. I concentrate on my schoolwork.	O	O	O	O	O	O	O

Appendix O

Goal-Setting Exit Questionnaire – REVISED (Sivaraman, 2012)

<u>Directions</u>: Please answer the following questionnaire based on the goal-setting program you just completed. In answering each question, use a range of (1) to (7), where (1) stands for strongly disagree and (7) stands for strongly agree. Please mark only one choice per question.

	Strongly Disagree (1)	*Disagree (2)*	*Slightly Disagree (3)*	*Neither Agree nor Disagree (4)*	*Slightly Agree (5)*	*Agree (6)*	*Strongly Agree (7)*
1. I enjoyed this goal setting project.	O	O	O	O	O	O	O
2. I will probably set and work toward goals in the future.	O	O	O	O	O	O	O
3. I think setting goals is helpful to my future.	O	O	O	O	O	O	O
4. Setting academic goals can help me do better in school.	O	O	O	O	O	O	O

	Strongly Disagree (1)	*Disagree (2)*	*Slightly Disagree (3)*	*Neither Agree nor Disagree (4)*	*Slightly Agree (5)*	*Agree (6)*	*Strongly Agree (7)*
5. I think a friend would benefit from a goal setting project such as this.	O	O	O	O	O	O	O
6. This goal setting project was valuable to me.	O	O	O	O	O	O	O
7. I took this project seriously.	O	O	O	O	O	O	O
8. I feel this project helped me with my grades during this nine-week time period.	O	O	O	O	O	O	O

	Strongly Disagree (1)	*Disagree (2)*	*Slightly Disagree (3)*	*Neither Agree nor Disagree (4)*	*Slightly Agree (5)*	*Agree (6)*	*Strongly Agree (7)*
9. I completed this project because I had to and did not gain anything from it.	O	O	O	O	O	O	O
10. I believe that setting academic goals and breaking them down into smaller sub-goals can help me do better in school.	O	O	O	O	O	O	O

Appendix P

Daily Strategy Report

At the end of each day, please take a minute to record which strategies you successfully used with your student by placing a check in the appropriate column and row. Indicate any unusual or unexpected circumstances under the Comments *section. You may implement some of the strategies each day, while other strategies may not be used. Our goal is to implement as many of the strategies as possible as frequently as possible. Because this is a research project, we need an accurate accounting of how often each strategy is used. Please complete the form as honestly and accurately as possible. At the end of each week, please visit our website and transfer this information to our electronic form.*

Record for Week Beginning: _____

Intrinsic Value Strategies	M	Tu	W	Th	F	Comments
Provided interest enhancing activities, anecdotes, games, challenges, etc. that linked to the instructional objectives.						
Provided variety and choices for learning and/or showing mastery of the content.						
Provided optimally challenging learning activities.						
Used preassessment to match instruction to the student's current levels of academic functioning.						
Provided opportunities for active learning opportunities.						
Provided opportunities for immediate feedback.						
Enthusiastically presented content and treated students as eager learners.						
Attainment Value Strategies	M	Tu	W	Th	F	Comments
Provided students with opportunities to engage in authentic, significant tasks.						
Provided students with opportunities with tasks that are personally meaningful to the student.						
Provided students with models who value academic performance.						

Utility Value Strategies	M	Tu	W	Th	F	Comments
Explained the purpose of the lesson/assignments.						
Connected learning to students' current wants and/or future goals and aspirations.						
Showed the real world applications/ ramifications of the concepts covered in class.						
Shared personal stories about how others have used the knowledge or skills we are learning.						
Invited a parent, student, or community member to share how they use information from your course.						
Related learning activities to the objectives of the course.						
Developed connections between prior knowledge, curreent learning, and future uses.						
Rewards						
Provided student with an opportunity to obtain a reward for reaching a specific instructional goal.						
Individual Conferences: Circle the date the conference was held and record the length of time	M	Tu	W	Th	F	Time:
Used constructive confrontation techniques.						
Used active listening techniques.						
Completed the assigned session activities.						
Completed the assigned worksheets with the student.						
Helped student to clarify academic goals.						
Helped student to make plans to achieve academic goals.						

Appendix Q
Week One Schedule for Intervention/Interviews

Math Analysis Conferences with Miss Sullivan (Room 219) Week of October 12-16

Tuesday, October 13th (B day)

7:00 a.m. - **Student 18**
8:00 a.m. - **Student 22**
8:10 a.m. - **Student 13**
8:20 a.m. - **Student 17**
8:30 a.m. - **Student 2**
8:40 a.m. – **Student 8**
12:05 p.m. - **Student 24**

Wednesday, October 14th (A day) - PSAT DAY

11:15 a.m. - **Student 25**
11:25 a.m. - **Student 7**
12:15 p.m. - **Student 16**
12:25 p.m. - **Student 11**
1:05 p.m. - **Student 1**

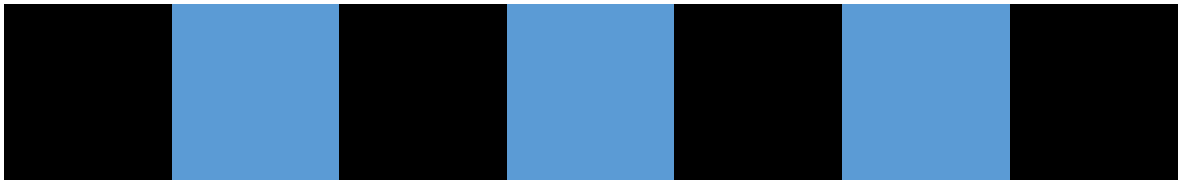
Thursday, October 15th (B day)

7:10 a.m. - **Student 3**
7:30 a.m. - **Student 5**
7:40 a.m. - **Student 20**

Friday, October 16th (A day)

7:10 a.m. - **Student 19**
7:30 a.m. - **Student 4**
9:00 a.m. - **Student 23**
9:10 a.m. – **Student 9**
10:15 a.m. - **Student 14**
11:55 a.m. - **Student 21**
12:25 p.m. - **Student 15**

Appendix R
Week Two Schedule for Intervention/Interviews



Math Analysis Conferences with Miss Sullivan (Room 219)
Week of October 19-23

Monday, October 19th (B day)

7:30 a.m. - **Student 18**
7:45 a.m. - **Student 17**
8:00 a.m. - **Student 22**
8:15 a.m. - **Student 3**
8:30 a.m. - **Student 5**
8:45 a.m. - **Student 20**
9:00 a.m. - **Student 8**
12:05 p.m. - **Student 24**
12:15 p.m. - **Student 25**

Tuesday, October 20th (A day)

7:00 a.m. - **Student 14**
7:30 a.m. - **Student 4**
7:45 a.m. - **Student 19**
8:00 a.m. - **Student 21**
8:30 a.m. - **Student 1**
9:00 a.m. - **Student 23**
9:20 a.m. - **Student 9**
10:30 a.m.– **Student 7**
10:45 a.m. - **Student 16**
11:30 a.m. - **Student 11**

Thursday, October 22nd (A day)

8:25 a.m. - **Student 15**

Friday, October 23rd (B day)

8:30 a.m. - **Student 2**
8:45 a.m. - **Student 13**

Appendix S
Week Three Schedule for Intervention/Interviews

Math Analysis Conferences with Miss Sullivan (Room 219)
Week of October 26-30, 2015

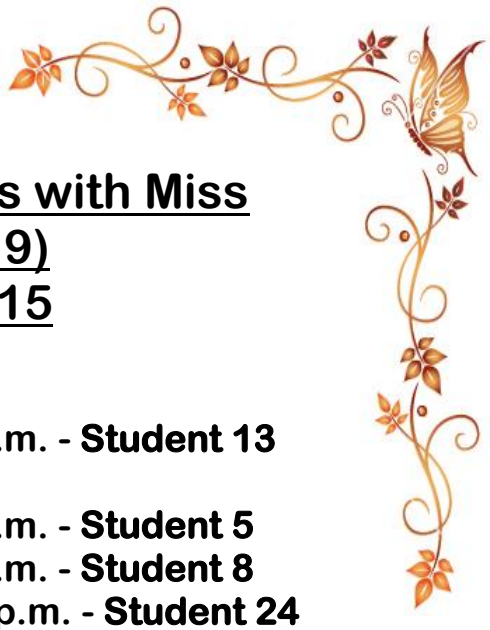
Thursday, October 29th (B day)

7:10 a.m. - **Student 18**
7:30 a.m. - **Student 3**
7:45 a.m. - **Student 5**
8:00 a.m. - **Student 22**
8:30 a.m. - **Student 20**
8:45 a.m. - **Student 17**
9:00 a.m. - **Student 8**
9:20 a.m. - **Student 25**
12:05 p.m. - **Student 24**
12:15 p.m. - **Student 2**

Friday, October 30th (A day)

7:30 a.m. - **Student 4**
7:45 a.m. - **Student 19**
8:00 a.m. - **Student 21**
8:15 a.m. - **Student 15**
8:30 a.m. - **Student 1**
8:45 a.m. - **Student 14**
9:00 a.m. - **Student 23**
9:20 a.m. - **Student 9**
10:30 a.m.– **Student 7**
10:45 a.m. - **Student 16**
11:00 a.m. - **Student 13**
11:30 a.m. - **Student 11**

Appendix T
Week Four Schedule for Intervention/Interviews



Math Analysis Conferences with Miss Sullivan (Room 219) November 2-6, 2015

Monday, November 2nd (B day)

7:10 a.m. - **Student 3**
7:30 a.m. - **Student 18**
7:45 a.m. - **Student 20**
8:00 a.m. - **Student 22**
8:15 a.m. - **Student 17**
8:30 a.m. - **Student 13**
8:45 a.m. - **Student 5**
9:00 a.m. - **Student 8**
12:05 p.m. - **Student 24**
12:20 p.m. - **Student 25**

Wednesday, November 4th (A day)

7:10 a.m. - **Student 19**
7:30 a.m. - **Student 4**
7:50 a.m. - **Student 21**
8:10 a.m. - **Student 15**
8:30 a.m. - **Student 1**
8:50 a.m. - **Student 14**
9:10 a.m. - **Student 23**
9:30 a.m. - **Student 9**
10:30 a.m.– **Student 7**
11:30 a.m. - **Student 16**
11:50 a.m. - **Student 11**

Thursday, November 5th (B day)

8:10 a.m. - **Student 2**

Appendix U
Week Five Schedule for Intervention/Interviews

REVISED SCHEDULE
Math Analysis Conferences with Miss Sullivan
November 9-10, 2015

Monday, November 9th (B day)

7:10 a.m. - **Student 18**	12:05 p.m. - **Student 24**
7:30 a.m. - **Student 2**	12:20 p.m. - **Student 25**
7:50 a.m. - **Student 17**	12:50 p.m. - **Student 22**
	1:30 p.m. - **Student 13**

Tuesday, November 10th (A day) - Route 247 day

7:10 a.m. - **Student 14**	10:45 a.m.– **Student 7**
9:30 a.m. - **Student 9**	11:45 a.m. - **Student 16**
9:50 a.m. - **Student 23**	12:05 a.m. - **Student 11**

Thursday, November 12th (B day)

8:30 a.m. - **Student 5**	9:10 a.m. - **Student 8**
8:50 a.m. - **Student 20**	

Friday, November 13th (A day)

7:10 a.m. - **Student 19**	8:10 a.m. - **Student 15**
7:30 a.m. - **Student 4**	8:30 a.m. - **Student 1**
7:50 a.m. - **Student 21**	11:50 a.m. - **Student 3**

Appendix V
Week Six Schedule for Intervention/Interviews

SCHEDULE
Math Analysis Conferences with Miss Sullivan
November 16-20, 2015

Monday, November 16th (B day)

7:10 a.m. - **Student 18**
7:30 a.m. - **Student 22**
7:50 a.m. - **Student 13**
8:10 a.m. - **Student 5**
9:00 a.m. - **Student 9**
12:05 p.m. - **Student 24**
12:20 p.m. - **Student 25**

Tuesday, November 17th (A day)

9:10 a.m. - **Student 23**
9:30 a.m. - **Student 17**
10:30 a.m.– **Student 16**
11:30 a.m. - **Student 7**
11:50 a.m. - **Student 11**

Wednesday, November 18th (B day)

7:10 a.m. - **Student 20**
12:10 p.m. - **Student 1**

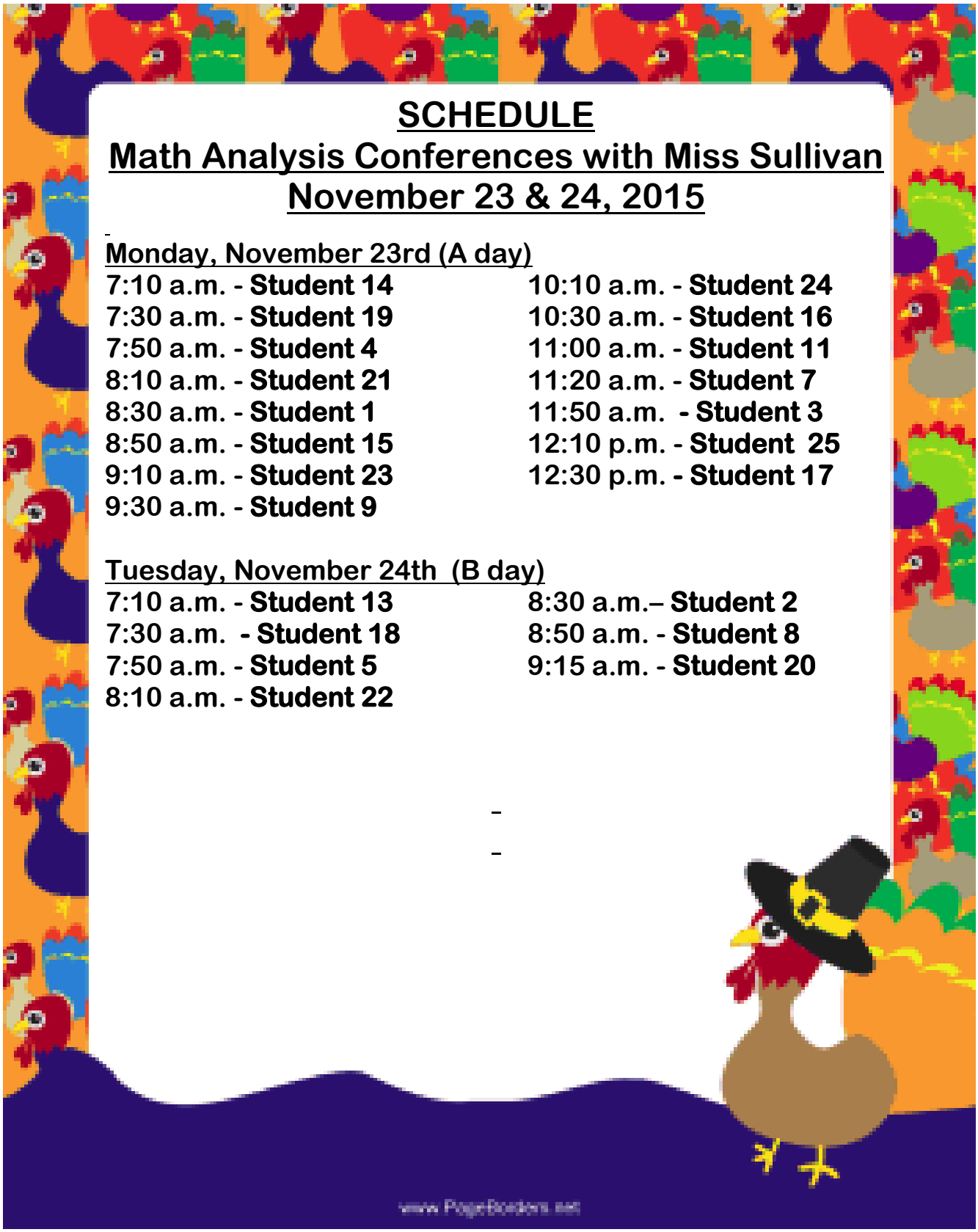
Thursday, November 18th (A day)

7:30 a.m. - **Student 19**
7:50 a.m. - **Student 4**
8:10 a.m. - **Student 21**
8:30 a.m. - **Student 15**
8:50 a.m. - **Student 14**
11:50 a.m. - **Student 3**

Friday, November 20th (B day)

8:30 a.m. - **Student 2**
8:50 a.m. - **Student 8**

Appendix W
Week Seven Schedule for Intervention/Interviews



SCHEDULE

Math Analysis Conferences with Miss Sullivan

November 23 & 24, 2015

Monday, November 23rd (A day)

7:10 a.m. - **Student 14**
7:30 a.m. - **Student 19**
7:50 a.m. - **Student 4**
8:10 a.m. - **Student 21**
8:30 a.m. - **Student 1**
8:50 a.m. - **Student 15**
9:10 a.m. - **Student 23**
9:30 a.m. - **Student 9**
10:10 a.m. - **Student 24**
10:30 a.m. - **Student 16**
11:00 a.m. - **Student 11**
11:20 a.m. - **Student 7**
11:50 a.m. - **Student 3**
12:10 p.m. - **Student 25**
12:30 p.m. - **Student 17**

Tuesday, November 24th (B day)

7:10 a.m. - **Student 13**
7:30 a.m. - **Student 18**
7:50 a.m. - **Student 5**
8:10 a.m. - **Student 22**
8:30 a.m.– **Student 2**
8:50 a.m. - **Student 8**
9:15 a.m. - **Student 20**

Appendix X
Week Eight Schedule for Intervention/Interviews

SCHEDULE
Math Analysis Conferences with Miss Sullivan
November 30 –December 4, 2015

Monday, November 30th (B day)

7:30 a.m. - **Student 13**
7:50 a.m. - **Student 18**
8:10 a.m. - **Student 17**
8:50 a.m.– **Student 8**
12:05 p.m. - **Student 24**
12:20 p.m. - **Student 25**
12:50 p.m. - **Student 15**

Tuesday, Dec. 1st (A day) - Route 247 day

7:10 a.m. - **Student 4**
7:30 a.m. - **Student 19**
7:50 a.m. - **Student 21**
8:10 a.m. - **Student 1**
9:25 a.m. - **Student 14**
9:45 a.m.– **Student 23**
10:05 a.m. - **Student 9**
10:45 a.m. - **Student 16**
11:45 a.m.– **Student 7**
12:05 p.m. - **Student 11**

Wednesday, December 2nd (B day)

7:30 a.m. - **Student 3**
7:50 a.m. **Student 5**
8:10 a.m. - **Student 22**
8:30 a.m. - **Student 2**
8:50 a.m. - **Student 20**

Appendix Y
Week Nine Schedule for Intervention/Interviews

SCHEDULE
Math Analysis Conferences with Miss Sullivan
December 7 - December 11, 2015

Monday, December 8th (B day)

8:30 a.m. - **Student 18**
9:30 a.m. - **Student 8**
12:05 p.m. - **Student 24**

Wednesday, Dec. 9th (A day)

7:10 a.m. - **Student 4**
7:30 a.m. - **Student 19**
7:50 a.m. - **Student 21**
8:10 a.m. - **Student 1**
8:30 a.m. - **Student 15**
8:50 a.m. - **Student 14**
9:10 a.m.– **Student 23**
9:30 a.m. - **Student 9**
10:30 a.m. - **Student 16**
11:30 a.m.– **Student 11**
11:50 a.m. - **Student 7**
12:10 p.m. - **Student 13**

Thursday, December 10th (B day)

7:30 a.m. - **Student 2**
7:50 a.m. - **Student 5**
8:10 a.m. - **Student 22**
8:30 a.m. - **Student 3**
8:50 a.m. - - **Student 20**
12:05 p.m. - **Student 25**
12:25 p.m. - **Student 17**

Appendix Z
Intervention Questions Used for Qualitative Data

1) When do you put forth the most effort to do well in school?
2) What do you find interesting about this class?
3) Which value; intrinsic, utility, or identity do you find most valuable?
4) What is one area of your class performance that you really want to improve?
5) What is one thing that you can do NOW to help you reach your long-term goal?
6) How will you reward yourself when you achieve your goal?
7) This goal is important to me because
8) How do you think that you are doing in class?
9) What is your current grade in the class? (How do you know?)
10) What accomplishment from class are you most proud of?
11) What can you do to feel even better about yourself in class?

Appendix AA
Excerpt from Reflexive Journaling

August 18, 2015 – Today I met with G to go over the program (after I sent her the videos and website on August 15th). She seemed to understand the videos and the strategy sheet. She requested that the strategy sheet be one sheet with the dates of the entire intervention set up so she could realize which ones she needs to do. The meeting lasted about 30 minutes since she knew most of what was going on. My one concern is that G is not willing to give me students during her class. She told me that she moves at a really fast pace and that the kids shouldn't leave her class. She said she hates when students go to the bathroom and then come back in and ask questions she just went over. I asked if there was a play we could put in place that if the students had to come and work with me. She said that if that was the case *no kid* would want to do that after she met them on the first day and explained the class. This is causing me to be anxious since I need the kids but need to keep her happy!

August 27, 2015 – Approval from School system FINALLY came through. Told G – she is excited as well.

September 2, 2015 – This is the day of my proposal defense. Stayed up for 24 hours to work on final revisions before going into the defense.

I PASSED my proposal defense. I edited and then sent a letter to be distributed to parents in order to inform them about my study. I learned that since the students are old enough and that the intervention I would be using is part of my job as a gifted resource teacher that I would only need the students' assent. I went to both G 3A and 3B parent open house to explain what we would be doing this year.

September 24 and **25**, **2015** – I gave the SAAS-R to both 3A and 3B classes. On the back of the pretest was the student assent form. When I review the letters 1 student opted out of the study in 3A and 1 student opted out in 3B. I have also been noticing that the 3A class dropped from 30 students to 27 students and 3B class dropped from 30 students to 25 students. I'm worried about the credibility of my study with the numbers dropping.

October 6, 2015 – I have continued to monitor and enter in grades for both 3A and 3B. Today I had a meeting with P and S to discuss the size of the population. S gave suggestions of how I will make this credible and told me that my qualitative component was going to be very important. Both S and D said that it is time to run tests to make sure groups are the same. Both suggested I flip a coin to decide the treatment group.

VITA

Missy Sullivan, M.Ed.
Gifted Resource Teacher
First Colonial High School
1272 Mill Dam Road
Virginia Beach, VA 23454
Office Phone: 757-648-5300 ext. 57464
Home Phone: 757-477-6994
Email: Melissa.sullivan@vbschools.com

EDUCATION

2012-2016	Ph.D. Curriculum & Instruction received from Old Dominion University, Norfolk, VA.
2000-2003 Storrs, CT.	M.Ed. Gifted Education received from University of Connecticut,
2000-2003 Norfolk, VA.	Drama Endorsement received from Virginia Wesleyan College,
1990-1995	M.Ed. Administration and Supervision received from Bowie State University, Bowie, MD.
1985-1989	B.S. Early Childhood/Elementary Education received from Towson State University, Towson, MD.

EXPERIENCE

POST-SECONDARY TEACHING EXPERIENCE

Tidewater Community College:

- CHD 118: Language Arts for Young Children
- CHD 120: Introduction to Early Childhood
- CHD 145: Teaching Art, Music, and Movement to Children
- CHD 146: Math, Science, and Social Studies for Children
- EDU 200: Introduction to Teaching as a Profession

Virginia Wesleyan College:

- INST 202: School and Society

University of Virginia:

- EDLF 5500-1:Introduction to Gifted Education
- EDLF 5500-2:Models and Strategies for Gifted Programs
- EDLF 5500-3:Differentiating Instruction for the Gifted
- EDLF 5500-4:Curriculum for the Gifted

2012-Present	9-12th Grade Gifted Resource Teacher, First Colonial High School, Virginia Beach City Public Schools, Virginia Beach, VA.
2008 – Present	Education Adjunct Faculty, Virginia Wesleyan College, Virginia Beach, VA.
1998 – Present	Education Adjunct Faculty, Tidewater Community College Virginia Beach, VA.
2011- 2012	Administrative Assistant, Kempsville High School Virginia Beach City Public Schools, Virginia Beach, VA.
2008 –2011	9-12th Grade Gifted Resource Teacher, Kempsville High School, Virginia Beach City Public Schools, Virginia Beach, VA.
2007 – 2011	Gifted Education Adjunct Faculty, University of Virginia, Charlottesville, VA.
1999- 2008	6-8th Grade Gifted Resource Teacher, Kempsville Middle School, Virginia Beach City Public Schools, Virginia Beach, VA.
1997-1998	3rd grade teacher, Crofton Woods Elementary School, Anne Arundel Public Schools, Annapolis, MD.
1996-1997	4/5th grade teacher, Crofton Woods Elementary School, Anne Arundel Public Schools, Annapolis, MD.
1995-1996	4th grade teacher, Crofton Woods Elementary School, Anne Arundel Public Schools, Annapolis, MD.
1993-1995	3rd grade teacher, Annapolis Elementary School, Anne Arundel Public Schools, Annapolis, MD.
1990-1993	5th grade teacher, Annapolis Elementary School, Anne Arundel Public Schools, Annapolis, MD

PRESENTATIONS AT PROFESSIONAL MEETINGS

Sullivan, M.C. (2015, October). *Implementing Service Learning with Gifted Students*. Virginia Gifted 2015 Conference, Richmond, VA.

Sullivan, M.C. (2015, October). *Reversing Underachievement in High School Students: One Schools' Plan*. Virginia Gifted 2015 Conference, Richmond, VA.

Sullivan, M.C. (2014, November). *Beyond AP: One High Schools Answer to Gifted Programming*. 61st Annual Convention of the National Association for Gifted Children, Baltimore, MD.

Sullivan, M.C. (2013, November). *Reversing Underachievement in High School Students: One School's Plan*. 60th Annual Convention of the National Association for Gifted Children, Indianapolis, ID.

Sullivan, J.E. & **Sullivan, M.C.** (April, 2013) *Differentiation for Students with Autism*. Session presented at the Accessibility Summit. Reston, V.A.

Sullivan, M.C. (March, 2011) *Gifted Services at the High School Level*. Session presented at the National Curriculum Network Conference. Williamsburg, V.A.

Sullivan, M.C. (March, 2007) *Adapting the Schoolwide Enrichment Model: A Type II ½ Investigation*. Session *to* presented at the National Curriculum Network Conference. Williamsburg, V.A.

GRANTS

Sullivan, M.C. & Sullivan, J. (May 2016-June 2017) *Rotarian Scholarship for First Colonial Interact Club Member*. Cape Henry Rotary Club. Funded $1000 scholarship.

Sullivan, M.C. (December 2014-April 2015) *Lead to Feed Technology Award Grant*. Lift a Life Foundation. Funded $5000 Apple computers.

Sullivan, M.C. (December 2013-April 2014) *Lead to Feed Technology Award Grant*. Lift a Life Foundation. Funded $8000 for community outreach program.

Sullivan, M.C. (December 2023-April 2013) *Lead to Feed Technology Award Grant*. Lift a Life Foundation. Funded $4000 for community outreach program.

Sullivan, M.C. (December 2013-April 2014) *Lead to Feed Technology Award Grant*. Lift a Life Foundation. Funded $5000 for community outreach program.

Sullivan, M.C. (August 1998 – May 1999) *Math Their Way Grant*. The Center for Innovative Education. Funded $5000 for math program.

Arbogast, D. & **Sullivan, M.C.** (August 1994 – May 1995) *Title I Grant*. US Department of Education. Funded $17,000 for reading program.

RESEARCH AND MANUSCRIPTS IN PROGRESS

Sullivan, M.C. (2016) *Investigating an Intervention Used to Address Underachievement in Gifted and Non-Gifted High School Students: A Mixed Methodological Study.* Old Dominion University.

HONORS, AWARDS, AND PRIZES

Tagged by the Superintendent – Honored by the Virginia Beach City Public Schools Superintendent for

exceptional performance on the job, 2007

Virginia Beach City Gifted Teacher of the Year – Honored by the Virginia Beach City Public Schools

Gifted Department for exceptional performance as a gifted resource teacher, 2006

Kemspville Middle School Teacher of the Year - Honored by the faculty and staff of Kempsville Middle

School for exceptional performance as teacher, 2004

Kemspville Middle School Distinguished Educator - Nominated by the faculty and staff of Kempsville

Middle School for exceptional performance as teacher, 2002 & 2001

Kempsville Middle School Continued Education Award - $500 given by the PTA to teachers continuing

beyond their bachelor's degree, 2002

Nominee for VBCPS Gifted Teacher of the Year - Nominated by the Virginia Beach City Public Schools

Gifted Department for exceptional performance as a gifted resource teacher, 2001

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

American Educational Research Association (since 2012)

Virginia Beach City Public School Association for Secondary Administrators (Since 2012)

National Association for Gifted Children (since 2000)

Virginia Association for Gifted Children (since 2000)

Association of Supervision and Curriculum Development (since 1993)

Virginia Theatre Association (Board Member) (since 2005)

SERVICE

Professional organizations:

Served as the coordinator of the Virginia Theatre Associations Young People's Festival, 2005 to 2008Curriculum development committee member for revision of the Virginia State theatre standards of learning (grades 6-8), 2006

Service in other organizations:

Curriculum development committee member for revision of the Virginia Beach City Public Schools social studies curriculum, 2013

Served on the Eligibility Committee for entrance to the Salem High School Performance Arts Academy, 2013

Served on the Eligibility Committee for entrance to the First Colonial High School Legal Studies Academy, 2013

Member of the administrator's city-wide balanced assessment committee for the Virginia Beach City Public Schools, 2012

Served on the Eligibility Committee for the identification of students for intellectual gifted programs in Virginia Beach City Public Schools, 2008

Created curriculum for Virginia Opera to be used with schools who attended their

performances, 2008-2011