THE ROLE OF SELF-REGULATION STRATEGIES ON TWO- AND FOUR-YEAR COLLEGE STUDENTS WITH ADHD

by

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DEDICATION

For my supportive parents, Robert and Sandra Haig;

My siblings, Brian and Steven Haig;

And the rest of my wonderful family.
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To my chairperson, Dr. Patricia Tobey; my dissertation committee members Dr. Robert Rueda and Dr. Jerry Chih-Yuan Sun; Dr. Youn Joo Oh, Dr. Helena Seli, Dr. Gokce Gokalp, Dr. Ilda Jimenez y West, Dr. Linda Fischer, Dr. Rocke DeMark, Dr. Annemarie Perez, and Kevin Collins; my family and friends; and to all who participated in this study, I give my appreciation and gratitude for your support, guidance, and time.
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ABSTRACT

This study examined the relationship between self-regulation strategies and their relationships with college students with attention-deficit/hyperactivity disorder (ADHD). This area has not been widely examined so this research was conducted in order to investigate the role of self-regulation strategies on college students with ADHD. The research design used was a case study approach and mixed methodologies.

A sample of 48 students were sampled at three different colleges in Southern California, one being at a four-year large urban college in Los Angeles, another being at a medium four-year public college in Orange County, CA, and the last being at a medium size two-year college in Orange County, CA. At each college, there were 16 students sampled, eight diagnosed with ADHD and eight not diagnosed with ADHD. Information was gathered using the Self-Regulations Questionnaire (SRQ) survey. Additionally, an interview was conducted.

A descriptive study utilizing survey and semi-structured interview was used. The reason for interviews being done was because of the small sample size. The analysis was on meanings, themes, and general descriptions of experiences. The narrative approach was used to get the “essence” of each college student’s experience having been diagnosed with ADHD and how they self-regulated as students.

The results provided support for the importance of self-regulation strategies for college students with ADHD. Quantitative results support the position that self-
regulation strategies play a role in helping college students with ADHD. Qualitative results also support this finding. The results of these and related findings are discussed in this study.
CHAPTER 1
INTRODUCTION

Overview

The purpose of this study is to examine the relationship between self-regulation strategies and their relationship with college students with attention-deficit/hyperactivity disorder (ADHD). Solid advances have been made in regard to research in both the areas of ADHD and self-regulation, yet research examining self-regulation strategies and how they relate to ADHD are still relatively new (Peterson, 2007; Zimmerman, 2008). This study will identify self-regulation strategies that can be used to help college students with ADHD, and thus advance research in this area.

Background of the Problem

Attention-deficit/hyperactivity disorder is the most common childhood behavioral disorder, and therefore, it has received considerable attention in research over the years (Reiff, 2004). ADHD is a disorder that is characterized by inattention, impulsiveness, and hyperactivity (Alexander-Roberts, 2006, American Psychiatric Association, 2000). Students with ADHD can have significant impairments in home, school, and in social functioning (Alexander-Roberts, 2006; Peterson, 2007; Reiff, 2004). Because of the diverse challenges students with ADHD face, considerable attention has been given to the area of treating students effectively with ADHD. Much of the research conducted has led to advances in the understanding of treatment of ADHD with a lot of focus on medical treatment (Alexander-Roberts, 2006). Yet, some research has focused on non-drug treatments that have had success
(Bernstein, 2007; Jacobelli & Watson, 2008). With research being conducted on treating individuals without medication, and having shown progress, this area of research is important; and therefore, it is continually being further explored.

A great deal of intervention research has been conducted in the area of ADHD and self-regulation in recent years (Wong, 2004). The goal with this research is to understand more deeply the relationship between ADHD and self-regulation, and the solutions that can be implemented to help students become more successful in school who have ADHD. Self-regulated behaviors include a variety of methods used by students to manage, monitor, record and assess the behavior or academic achievement (Reid, Trout, & Schartz, 2005). The goal of the researcher is to find solutions to enable self-regulated behavior among students who have ADHD so that they can become more successful in school.

An area that has shown success in treating students with ADHD is self-regulation (Wong, 2004). Self-regulation is the process where students activate and sustain behaviors, cognitions, and affects that systematically orient them to reach goals (Schunk, Pintrich, & Meece, 2008). Research has shown that students with ADHD have had difficulties with or deficiencies in self-regulation processes (Barkley, 1997). There have been both academic and social difficulties with students with ADHD from problems related to self-regulation. These challenges include maintaining on-task behaviors, following through when given instructions, and planning and directing goal-directed, future actions (Barkley, 1997). Therefore, the area of self-regulation has become important when addressing ADHD. If educators
can better understand self-regulation and its link with ADHD, then solutions can be found to help students become more self-regulated, and therefore, more successful in school.

**Statement of the Problem**

The problem being explored is that there is not enough research on how self-regulation strategies can help college students who have ADHD perform better. There is much research on each independent area of self-regulation and ADHD, but combining the two and identifying how self-regulation strategies can help students with ADHD has not been extensively studied (Reid, Trout, & Schwartz, 2005). The college student population, in particular, has had limited research in this area.

Students with ADHD are underperforming in the educational system. Retention and graduation rates of students with ADHD are alarming (McGoldrick & Wolf, 2006). Students with disabilities such as ADHD are more likely to pursue only a two-year degree instead of a four-year degree. Furthermore, according to the Department of Education National Center of Education Statistics, they are more likely to drop out prior to completing a degree. They are also less likely to pursue post-graduate education than those students who do not have ADHD. A Department of Education National Center of Education Statistics report finds that only 4% of students with disabilities comprise graduate and professional student populations (McGoldrick & Wolf, 2006). This problem is severe and needs to be addressed. Helping students who have ADHD become more self-regulated learners is an
important step to helping students become more successful inside and outside of the classroom (Reif, 2005).

Purpose of the Study

The purpose of this study is to examine the role between self-regulation strategies and ADHD on college students. The following research questions guide the investigation:

1. What role does self-regulation play in the learning experience of college students with ADHD compared to college students without ADHD?
2. What role does self-regulation play in the learning experience of college students with ADHD and without ADHD at a two-year college vs. four-year college level?

This study will use a mixed methodology approach. A self-regulation survey will be used in combination with a case study approach with qualitative methodology. The goal is to understand the experiences of college students with ADHD and their experience using self-regulation strategies.

Importance of the Study

This research study will bring together a number of constructs and examine them in a way that has not been extensively studied. These constructs include ADHD and self-regulation and how self-regulation strategies can help college students with ADHD become more successful in college. Self-regulation strategies can play an important role in helping college students with ADHD become more successful in school, home, and social functions.
The implications of identifying self-regulation strategies that are effective for students with ADHD can be profound. Possible outcomes can include the elimination or the lessening of drug treatment. Additionally, students will have another way to manage the challenges they have with ADHD. They will have another “toolbox” of strategies that will allow them to be more successful.

Because the dropout rate is high for college students with learning disabilities such as ADHD, and also because students do not go as far in the educational system with ADHD, providing solutions with self-regulations strategies can be effective. If educators can help college students with ADHD incorporate self-regulation strategies in their everyday lives, students will go further in the educational system, and the dropout rate will decrease.

This is an important area because researchers have begun to find treatments recently that do not involve medical treatment (Alexander-Roberts, 2006; Jacobelli & Watson, 2008). Many people including researchers, school administrators, parents, and students are looking for solutions to ADHD that do not involve medication, or that combine medication with alternative strategies. Self-regulation strategies have begun to become a more effective alternative to, and in addition to, medicine for students with ADHD (Jacobelli & Watson, 2008).

This study will examine college students with ADHD at both the four-year college level and the two-year college level. The purpose of conducting research at both college levels is to better understand the difference in self-regulation strategies with these diverse student populations. The goal is to determine how the student
populations differ at both college settings so that more effective solutions can be used for college students with ADHD at diverse college environments.

In summary, finding non-medical treatments such as self-regulation strategies to help college students with ADHD can help them become more successful inside and outside of the classroom.

**Limitations and Delimitations**

There are some limitations and delimitations to this research. First, a small group of individuals will be interviewed using only three colleges, the first a large four-year private urban college in Los Angeles, the second a medium four-year public college in Orange County, CA, and the third a two-year college in Orange County, CA. A second limitation is that there will only be a small of group of students interviewed at each college. There will be eight students with ADHD and eight students without ADHD randomly selected at each college. Students will be chosen by responding to an email request and also through snowballing. This small interview size may not give a full representation of the research being conducted. Finally, a limited number of questions will be asked giving students the opportunity to answer in an open-ended format. The limited number of questions may not provide a strong enough background in thoroughly addressing the research questions being investigated in this study.

**Definitions**

The following terms are used throughout this research study (alphabetical order):
Attention-deficit/hyperactivity disorder. ADHD is a neurobiological behavioral disorder characterized by the onset of chronic inattention, impulsivity, and hyperactivity (Rief, 2005).

Self-Regulation: Proactive processes that students use to become more academically successful. These processes include goal-setting, selecting and deploying strategies, and self-monitoring one’s effectiveness (Zimmerman, 2008).

Executive Functioning: The actions of planning, goal-directed behavior, interference control, effort and flexible organization (Dennis, 1991).

Self-management: Required that an individual focus on his or her behavior and monitor it accurately (Barry & Messer, 2003).

Self-control: A response or series of responses by an individual that functions to alter the probability of their subsequent response to an event and thereby change the likelihood of a later consequence related to that event (Barkley, 1997).

Self-regulated learning: “An active constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment” (Pintrich & Zusho, 2007).
CHAPTER 2
REVIEW OF THE LITERATURE

The following literature review will examine Attention deficit hyperactivity disorder (ADHD, AD/HD or ADD) as it relates to self-regulation. The first section will focus on the background of ADHD, its immersion as an important research area and the evolution of its progress in understanding what it is all about and how to effectively treat individuals with ADHD. Next, self-regulation will be discussed giving a foundation and historical analysis as well as how understanding and solutions in this area has progressed. ADHD and self-regulation as they relate with one another will then be discussed. This section will examine the relationship between self-regulation and ADHD and the solutions for how college students can become more self-regulated, thus leading to higher graduation rates. Finally, limitations will be discussed leading to why this research area is important.

ADHD

Attention deficit hyperactivity disorder (ADHD, AD/HD or ADD) is a neurobehavioral development disorder. The U.S. National Institute of Mental Health states that attention-deficit hyperactivity disorder is a legitimate psychological condition. The problems that individuals with ADHD have are attention span, impulse control, and activity level (Barkley, 2000, American Psychiatric Association, 2000). These problems cause individuals to have trouble controlling their own behavior and keeping and sustaining future goals. ADHD is a real disorder and can have strong negative implications on one’s life (Ford, 2007; Taylor, 2007).
There are more than four million children and up to four percent of adults in the United States with ADHD (Petersen, 2007). ADHD is one of the most commonly studied and diagnosed psychiatric disorders, with 30-50 percent of individuals diagnosed in childhood continuing to have symptoms into adulthood (Peterson, 2007; Reiff, 2004). Symptoms of ADHD usually begin when a child is seven years or younger. Many experts state that ADHD causes deficits in executive functions of the brain (Alexander-Roberts, 2006). The following problems can occur as a result of impaired executive functions:

- Impaired planning and organization skills;
- Difficulty establishing and executing goals;
- Inability to have control over emotions;
- Inability to alter efficiently from one mental activity to another.

These impairments can have a significant impact on one’s life (Bernstein, 2007; Ford, 2007; Taylor, 2007, American Psychiatric Association, 2000). Hyperactivity is one of the key impairments which are often associated with ADHD.

The level of activity between a student with ADHD and one without ADHD may be similar, but there are key differences in brain motor functioning. For example, a child’s brain more activity intensifies than the levels of other children when a high demand is placed on the ADHD child’s attention (Peterson, 2007). One of the challenges with ADHD is that individuals who have it look normal; there are no outward signs that there is something wrong with the brain or central nervous system (Barkley, 2000). Students with ADHD can have a lot of difficulty inside a
busy classroom which can lead to erratic behavior. Other impairments children have with ADHD include impulsivity, temper explosions, and erratic behavior (Alexander-Roberts, 2006). ADHD can progress to be severe in later life leading to a range of problems including inattention, anxiety, and criminal activity (Barkley, Fischer, Smallish, & Fletcher, 2002; Alexander-Roberts, 2006; Peterson, 2007).

The one aspect individuals who have ADHD have in common is a reduced ability to filter out sights, sounds, and activities that are not related to what they should be doing (Petersen, 2007). This challenge causes interference in diverse settings and impedes success. Symptoms of ADHD cause day-to-day problems with learning behavior, and therefore, make it difficult to make and maintain relationships and perform many standard everyday tasks (Alexander-Roberts, 2006; Petersen, 2007). For example, students will be working on an assignment and then forget what the instructions are or they will become distracted easily by something else. Students will become anxious and not be able to sustain a level of activity for a long period of time (Bernstein, 2007; Taylor, 2007). This includes paying attention in class, interacting with others, and having any sustained focus and concentration on particular topic. In other words, ADHD can play a strong role in detracting students from succeeding in school and in other areas of their life.

Categories of ADHD

ADHD can be broken down into three major categories according to the book Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV-TR, 2000): 1. Hyperactive/impulsive-type, 2. Inattentive-type, and 3. Combined-
type. To be diagnosed with ADHD, individuals must show a few symptoms and these symptoms must negatively impact one’s ability to function in at least two settings; for example, at home or in a school environment. If symptoms continue for six months or more, then this can alert doctors that there is a problem.

Hyperactive/Impulsive-Type ADHD is the most common form of ADHD associated with this disorder (Alexander-Roberts, 2006). It is the symptoms of hyperactivity and impulsiveness that first alerted physicians more than a hundred years ago that this disorder existed (Petersen, 2007).

Hyperactivity can sometimes be difficult to diagnose because the symptoms tend to vary from one situation to another (Rief, 2005). For example, a hyperactive child may behave like other children when engaging in calm tasks or normal play and show no signs of ADHD; however, if the situation becomes too complex or tense, the child may begin to move quickly, talk loudly, or may engage in other hyperactive actions that are characteristic of a child with ADHD (Petersen, 2007). Over-stimulating environments may trigger impulsiveness also (Rief, 2005). When there is too much going on in a classroom or at home such as noise, diverse activities, or other stimuli, a child might become stressed, have a temper tantrum, or even cry (Barkley, 2000). Students with ADHD need calm environments with little distraction in order to perform effectively.

Boys and girls exhibit slightly different symptoms (Alexander-Roberts, 2006; Petersen, 2007; Rief, 2005). Boys exhibit more of the hyperactive/impulsive type of
behavior whereas girls tend to be a bit tomboyish, gravitating toward boys as friends. Girls can also engage in excessive socializing and talking (Petersen, 2007).

For Inattentive-Type ADHD, inattention and distractibility are the main characteristics (Petersen, 2007). This form of ADHD appears to be more common in girls than in boys. The common symptoms for boys are lack of motivation, laziness, or poor performance in school (Rief, 2005). Girls sometimes get overlooked because they appear less assertive or “dreamy.” The three settings where Inattentive-Type ADHD is apparent are those settings that are over stimulating, those that are boring, and those that involve many new stimuli (Petersen, 2007).

Students with Inattentive-Type ADHD who are subjected to too much information tend to “zone out.” They may retreat due to the overload of information or simply direct their attention on a new task. This might include staring out the window or spinning a pencil on their desk. These actions prevent the individual from returning to the task at hand (Petersen, 2007).

Combined-Type ADHD is when an individual exhibits both categories of ADHD. To be diagnosed with this type of ADHD, at least six symptoms of hyperactivity/impulsivity along with at least six of inattention must be identified (Petersen, 2007; Rief, 2005).

Individuals who have ADHD often have challenges with “executive functions”, they cannot organize and plan, keep their emotions in control, utilize short-term memory, or transition smoothly between tasks (Petersen, 2007). Other symptoms of ADHD include clumsiness or poor physical health coordination,
difficulty with social relationships, and a need for instant gratification. They also have trouble keeping track of things or being on time.

Individuals who have ADHD early in life will experience it later in life also (Alexander-Roberts, 2007; Petersen, 2007; Rief, 2005). But, with maturity and especially a treatment plan, some degree of remission can occur. Adults will be less hyperactive and may only experience general restlessness. Impulsivity usually declines also as adults build coping skills and life experience. Inattention is still prevalent in adults (Petersen, 2007; Rief, 2005). If ADHD is untreated in adults, it can have negative outcomes which include drinking, smoking, drugs, and other criminal activity.

**Diagnosing Individuals with ADHD**

In diagnosing individuals with ADHD, it is important to note that the symptoms associated with ADHD are normal human behaviors (Petersen, 2007; Rief, 2005). Almost everyone has distractions, hyperactivity, or impulsivity to a certain extent. The distinction is that for most individuals, the symptoms are short-term which result in brief behaviors of an individual having the characteristics of ADHD (Alexander-Roberts, 2007; Rief, 2005). For individuals with long-term behavior associated with ADHD, many professionals must work together to gain a complete picture of a child’s physical and mental health (Barkley, 2000; Alexander-Roberts, 2005; Petersen, 2007; Rief, 2005). They must be able to effectively assess a child’s physical and mental health in a variety of settings including at home, at school, and in social settings. A child’s assessment can begin with medical records
and having a pediatrician assess the child. The medical doctor can assess problems with eating, sleeping, depression, or any other illness (Rief, 2005). A therapist or psychiatrist can also assess a child’s condition to determine whether or not ADHD symptoms do exist.

Additionally, parents and teachers can play a large role in assessing a child’s behavior and raising a red flag when necessary (Petersen, 2007; Rief, 2005). Red flags consist of ADHD behavior patterns or also a parent’s alcohol intake during pregnancy or family thyroid disease. Teachers can assess students on problem solving skills, attention, learning disabilities, or depression. In summary, it takes a team of people to properly assess, diagnose, and treat an individual with ADHD.

**Etiology and Theoretical Framework of ADHD**

In the past, there were many different explanations which include brain injuries, poor parenting, or ineffective teaching (Petersen, 2007; Rief, 2005). Today, however, medical experts have a stronger understanding of this disorder and its onset. Medical experts agree that ADHD is a medical disorder of the brain (Alexander-Roberts, 2006; Petersen, 2007; Rief, 2005). Simply, the human body produces more than sixty different types of neurotransmitter chemicals, five of which are directly related to causing ADHD. These include: 1. Dopamine, 2. Serotonin, 3. Norepinephrine, 4. Epinephrine, and 5. GABA (gamma-aminobutyric acid). In each of these areas, low levels are correlated with the role in ADHD. Additionally, environmental factors also play a role in causes of ADHD (Barkley, 2000; Petersen, 2007; Rief, 2005). For example, a mother’s drug or alcohol use during pregnancy
can cause symptoms of ADHD. This is because a mother shares a blood supply with the unborn child. These toxic chemicals can cause a fetus’s brain to develop poorly, and thus cause the onset of ADHD. Aside from a mother’s pregnancy, two types of chemical toxins have also been linked to ADHD. These are lead and polychlorinated biphenyls (PCBs) (Petersen, 2007). Lead can be found in house paint and PCBs as insulation in industrial and commercial buildings. Action has been taken since the release of these chemicals to prevent their usage. In summary, causes of ADHD can be both genetic and environmentally induced.

Dr. Russell Barkley (1997) provided a theoretical framework for better understanding ADHD and its effect on individuals with it. Barkley argues that ADHD causes behavioral inhibition. It stops an ongoing response and interferes with control mechanisms (Barkley, 1997). Barkley argues that behavioral inhibition is lined to the performance of four executive functions. These functions bring motor control, fluency, and syntax under control of internally represented information. These four executive functions are: 1. Working memory, 2. Self-regulation of affect/motivation/arousal, 3. Internalization of speech, and 4. Reconstitution. Each of these areas is negatively affected by individuals who have ADHD.

Working memory is holding events in the mind and manipulating or acting on events. Self-regulation of affect/motivation/arousal focuses on emotional control, self-regulation of drive and motivation, and regulation of goal-directed action. Internalization of speech is about problem solving and moral reasoning. Reconstitution is the analysis and synthesis of behavior as well as goal-directed
behavioral creativity. The focus of this study will be on self-regulation and its relationship with ADHD.

**Treatment Options for Individuals with ADHD**

**Medication.**

Individuals with ADHD have a variety of treatment options which include medications, behavior modifications, lifestyle changes, and counseling (Barkley, 2000; Bernstein, 2007; Jacobelli & Watson, 2008; Rief, 2005). ADHD cannot be cured; however it is treatable. Additionally, patients sometimes outgrow these disorders as they mature (Petersen, 2007).

Medication has been a key treatment for individuals with ADHD. There is nothing that works better to bring ADHD under control than medication (Alexander-Roberts, 2006). This has been, and continues to be, the case; however, individuals must be diagnosed properly before medication should be used. Many times, medication is not the answer and other options should be taken. If an individual is diagnosed effectively and medication is the desired direction, this treatment option can be very effective (Alexander-Roberts, 2006; Petersen, 2007; Rief, 2005).

Medication is used to control levels of inattention and hyperactivity. It has been shown to improve cognitive attention, factors that regularly impact academic success (Johnson & Safranek, 2005). There are two basic classes of ADHD medications: 1. Stimulants and 2. Non-stimulants. These medications help individuals in a number of ways from enabling them to concentrate better to allowing
them to be more productive. Students have seen an increase in academic performance and more focus in school.

The most common medication used over the years to treat individuals with ADHD is Ritalin. Ritalin has produced conflicting results when investigating the effects of this drug on cognition, achievement, and behavior (White, & Rouge, 2003). Research has provided short-term benefits of Ritalin on academic performance (Pelhan, Carlson, Sams, Vallano, Dixon, & Hoza, 1993). It shows to improve concentration and attention which is linked to academic performance. However, Ritalin has received some negative criticism due to individuals who have either received too much of it or who have been misdiagnosed (Alexander-Roberts, 2006). Additionally, children are sometimes prescribed Ritalin at an early age which is a concern. Lastly, there is lack of understanding and agreement among parents, teachers, and health professionals about which intervention is best, whether it be Ritalin, non-medical alternatives, or both (White, & Rouge, 2003).

Other medication options include dextroamphetamine (Dexedrine) and amphetamine (Adderall). Many studies have found that these medications enhance attention, reduce impulsive behavior, and increase academic productivity among the majority of children treated (White & Rouge, 2003; Chronis & Raggi, 2006). One study in particular found that students with ADHD had higher scores in both mathematics and reading with medication (Bruckner et al., 2012). Other studies show improvements on academic productivity and academic accuracy (Rief, 2005).
In summary, there are numerous medication options that have had a positive outcome on treating individuals with ADHD. Medication has helped individuals concentrate better, live more productive lives, and has helped children become more successful in school (Alexander-Roberts, 2006; Rief, 2005). With medication, studies have found that students can focus better, have increased attention span, decreased hyperactivity and impulsivity, and thereby have improved academic performance.

**Behavior modification.**

Behavior modification is another treatment option for individuals with ADHD. Behavior modification is a strategy that can be used to alter an individual’s behavior in a desired way. For example, a teacher can give a student with ADHD a reward for paying attention in class instead of talking with others. The student’s behavior will be changed in a positive way as a result of the reward (Miranda, Presentacion, & Soriano, 2011).

There are many different types of behavior modification strategies which can involve teachers, counselors, parents, and the students. Behavior modification strategies have been shown to be effective and help students become more successful in school. They have helped students increase attention, decrease disruptive behavior, and focus more on school-related tasks (Chronis & Raggi, 2006; Johnston & Mash, 2001; Alexandar-Roberts, 1994).

Classroom behavior management strategies have helped students become more successful in school (Pelham et al, 1998). Teachers use specific behavioral
techniques, including praise, effective commands, planned ignoring, and time out. These techniques help shape a student’s behavior in a desired direction and have helped student behave better and have more focus.

Some researchers have investigated multiple strategies in the classroom for students with ADHD (Hoza, et al., 2003). These strategies include the token system, reinforced self-evaluation, and training in study skills. In general, these interventions have shown positive results with improved adaptive functioning and more focus, which have led to higher levels of success in the classroom.

The research with intervention for students with ADHD from different areas including teachers and administrators has shown positive results (Wolraich, et al., 2005). These interventions include targeting behavioral techniques to address organization, study skills, attention, and underachievement. However, the challenge with these strategies is that they are labor intensive.

In summary, there are numerous options to treat individuals with ADHD. In many instances, a combination of methods can be used (Rief, 2005). Treating an individual using medical and non-medical strategies has shown to be effective in helping manage ADHD. With students, a combination of strategies can help them become more successful in school (Rief, 2005).

In recent years, an area of concern has been in medication. Using medication to treat students with ADHD has sparked controversy because of some against this treatment option (Alexander-Roberts, 2006; Petersen, 2007; Rief, 2005). There are some researchers as well as administrators and parents who do not think medication
is the answer to treat ADHD, especially in milder cases. They are always looking for alternative strategies to treat students. More recently, research has been conducted to find non-medical solutions for students with ADHD (Barkley, 2000; Jacobelli & Watson, 2008).

**Self-regulation strategies.**

An important treatment option for students with ADHD is using self-regulation strategies (Jacobelli & Watson, 2008). Self-regulation will be discussed in the next section, but simply, it is the process by which individuals can activate and sustain behaviors, leading them to reach desired goals (Schunk, Pintrich, & Meece, 2008). Recent research has found that helping individuals with ADHD develop self-regulation strategies can help them focus better, which leads them to better managing their ADHD (Rueda, Posner, & Rothbart, 2011). This research area has received more attention recently, especially because many are looking for alternatives to treat individuals with ADHD. The focus of this review will be on this new area of research and it will be thoroughly explored.

**Self-Regulation**

Self-regulation is the process where students activate and sustain behaviors, cognitions, and affects that systematically orient them to reach their goals (Schunk, Pintrich, & Meece, 2008). This is important because if students can become more self-regulated learners, they can then become more successful in school and in other areas of their lives. The goal is to determine how students can become masters of
their own learning process and thereby become more successful as students (Zimmerman, 2008).

Research on self-regulation of academic learning and performance began to emerge over two decades ago (Zimmerman, 2008). The goal was to better understand how students could become masters of their own learning processes. Over the years, researchers have begun to understand this area more and they have found how important self-regulation is in helping students become more successful in school and life (Zimmerman, 2002; Efklides, 2008).

The research in self-regulation has continued to develop and self-regulation is considered an important area for psychologists, educators, and others (Zimmerman, 2002). A key challenge in this area of research is that there is no commonly accepted definition of self-regulated learning competence (Wirth & Leutner, 2008). One reason for this lack of consensus is because there have been a great number of models produced over the last 30 years; yet there has been no single integration of the modes into a single coherent framework or theory (Wirth & Leutner, 2008). These models differ in the areas of self-regulated learning emphasized. These include whether self-regulated learning is a prerequisite for the competent self-regulation of a learning process or whether they describe the process of self-regulation in relation to an optimal sequence of phases (Wirth & Leutner, 2008).

One model that has received attention is based on a framework for how learners control learning processes and it involves six dimensions: 1. Motive, 2. Methods, 3. Time, 4. Physical environment, 5. Social environment, and 6.
Performance (Dembo et al., 2006; Schunk & Zimmerman, 1994; Zimmerman, 1994; Zimmerman & Risemberg, 1997). Motive refers to reasons for learning, goals, self-talk, and reward and punishments; methods refer to learning strategies; time refers to time management and when to study, physical environment refers to identification and elimination of distractors; social environment refers to help, collaboration, and communication; and performance refers to evaluation, reflection, and goal revision. Individuals who manage these dimensions and are successful at applying them show evidence of being a self-regulated learner.

**Areas of Self-Regulatory Skills**

Three areas of self-regulatory skills are: 1. planning, 2. monitoring, and 3. evaluation (Jacobs & Paris, 1987). Planning requires the selection of strategies and the allocation resources which affect performance. Examples include strategy sequencing, allocating time selectively, and making predictions before reading. Monitoring refers to one’s awareness of task performance and comprehension. An example of this is self-testing while learning. Studies have found a relationship between metacognitive knowledge and monitoring accuracy (Schraw, 1994; Schraw, Dunkle, Bendixen & Roedel, 1995) such that individuals who are more aware of their thoughts can therefore monitor them more effectively towards a desired outcome. Evaluating refers to estimating the efficiency of one’s learning. Examples include evaluating one’s goals and performance. Studies support the connection between metacognition and evaluation (Baker, 1989; Coutinho & Neuman, 2006; Efklides, 2008). Individuals who are more aware of their thinking evaluate decisions
more, and they do this more effectively than those who are not aware of their thinking.

Self-regulated learning (SRL) is different from measures of mental ability or academic performance because it refers specifically to the self-directive processes and self-beliefs that enable learners to transform their mental abilities into an academic performance skill (Zimmerman, 2008). An example of mental ability would be verbal aptitude and an example of academic performance outcome would be writing. SRL refers to a proactive process that students engage in rather than a reactive process. Students who are self-regulated learners set goals, they select and deploy strategies, and they self-monitor their effectiveness. The key issue of a self-regulated learner is whether or not they display characteristics of personal initiative, perseverance, and adaptive skills (Zimmerman & Schunk, 2007).

Over the years since research has developed in the area of self-regulation, much has been learned, and this area has evolved a lot (Boekaerts, Pintrich, & Zeidner, 2000). In the early years, the 1970s and 1980s, research was limited. Researchers such as Joel Levin, Michael Pressley, and Dale Schunk, and others focused on the impact of individual self-regulatory processes, such as goal-setting, strategy use, or self-instruction (Zimmerman, 2008). These studies found that these strategies produced superior results in learning, even in young children; however, students did not use the strategies in non-experimental learning contexts very much, such as when studying at home (Pressley & McCormick, 1995).
Early efforts to understand the area of self-regulation were fruitful, yet incomplete. As research continued, further developments were made which helped give clarity and understanding to this important area. Some new questions also arose. These questions included whether or not increases in students’ levels of SRL in personally managed contexts, such as at home, were linked to improvements in academic achievement. Another question that was raised was whether or not teachers could modify their classrooms to foster increases in self-regulated learning. Lastly, questions concerning the role of students’ motivational feelings and beliefs arose on how they could begin incorporating self-regulation strategies in their lives (Zimmerman, 2008). In summary, as new research gave clarity and understanding to the area of self-regulation, so did new questions and how new discoveries could be translated into meaningful solutions.

Self-regulation of learning is more than knowledge of skills. It involves the self-motivation and behavioral skill to implement that knowledge in a desired direction. Furthermore, self-regulation is not a single personal quality trait that a student either possesses or not (Zimmerman, 2002). It involves a multitude of skills which include setting proximal goals for oneself, adopting, monitoring one’s performance, strategies for attaining goals, managing one’s time effectively, self-evaluating, and attributing causation to results. The success of a student’s level of learning is the result of how effectively he/she utilizes these self-regulatory skills (Schunk & Zimmerman, 1994).
Research conducted by Bandura was also important in the development of self-regulation. Of particular importance was Bandura’s (1969) research on how self-regulation could be developed from a cognitive social learning perspective. First, the self-regulation patterns that are desired should be modeled by agents of change such as parents or teachers (Zimmerman, 1990). Second, there should be incentives which are linked to performance and a grading system. As a student becomes more independent and self-regulated, the expert model would gradually withdraw support. Third, Bandura argued that in addition to the target behavior, individuals should be taught self-regulatory functions as standard-setting, evaluation, and self-reinforcement. Lastly, Bandura recommended that attention be given to the reference group so that the new self-regulated behavior will be sustained (Zimmerman, 1990).

As research continued to develop in this area, Bandura built upon his earlier discoveries. In the late 1970’s, Bandura developed a formal model of self-regulation which involved three key components: 1. Performance observation, 2. Judgmental processes, and 3. Self-reactive responses (Bandura, 1977). Performance observation involved such factors which included quality, quantity, and rate. For judgmental processes, this area involved performance attributions, performance standards, and referential performances. Lastly, for self-reactive, this area included self-evaluative reactions.

(Bandura, 1977). An individual’s motivation to succeed will be displayed Bandura argued and nonspecific and distal goals were not as effective as specific and proximal goals. A goal of social cognitive approaches to self-regulation is to develop behavior changes that are compatible with self and external factors (Zimmerman, 1990).

In 1986, a defining moment came when an inclusive definition of SRL was used to integrate many of its aspects including learning strategies, metacognitive monitoring, self-concept perceptions, and others (Zimmerman, 2008). As a result of this outcome, a number of instruments were developed.

**Self-Regulation Instruments**

One instrument developed was the Learning and Study Strategies Inventory, an 80-item self-report inventory of students’ strategies for enhancing their study practices was developed (LASSI; Weinstein, Palmer & Schulte, 1987). This inventory involves 10 scales that assess self-regulation strategies as well as skill and will; it is a classification system that corresponds with a motivational, behavioral, and metacognitive definition of self-regulation. Scales classified as will or motivation include Motivation, Attitude, and Anxiety. Scales classified as self-regulation or behavior include Time Management, Study Aids, Self-Testing, and Test Strategies. Scales classified as skill or metacognition include Concentration, Selecting Main Ideas, and Information Processing. When students complete this inventory, they respond to items in each subscale using a 5-point rating scale. These
ratings range from not at all typical of me to very much typical of me. This assessment is used in assessing student’s self-regulation skills (Zimmerman, 2008).

A second important instrument that was developed was the Motivated Strategies for Learning Questionnaire (MSLQ). This instrument is an 81-item questionnaire and it is composed of two major sections: 1. Learning Strategies and 2. Motivation. The Learning Strategies section is broken into two sub-sections which are a Cognitive-Metacognitive section and a Resource Management section. The Cognitive-Metacognitive section includes behaviors as managing time and study environment, effort management, peer learning, and help seeking. The Resource Management section includes behaviors such as managing time and study environment, effort management, peer learning, and help seeking (Zimmerman, 2008). The Motivation section has scales that relate to affect, valuing, and expectancy. The Affect section includes Test Anxiety; the Valuing scales include Intrinsic-Extrinsic Goal Orientation and Task Value, and the Expectancy scales include Self-Efficacy and Control of Learning. The rating system is a scale of 1-7 which range from not at all true of me to true of me. The MSLQ is considered to be an effective measure to assess students’ motivation and learning strategies (Duncan & McKeachie, 2010).

A third instrument used to assess self-regulated learning is the Self-Regulated Learning Interview Scale (SRLIS). Students are presented six problem contexts during a structured interview. They are asked to respond in a way that they would prepare for a writing or essay test. The answers are open-ended and the answers
given are then transcribed and coded into 14-self-regulatory categories. These categories focus on behavior, metacognition, and motivation. Each of these categories includes different areas. The behavior category includes environmental structuring, keeping records and monitoring, reviewing texts, notes and tests, and seeking assistance from peers, teachers and parents. The metacognitive categories include goal setting and planning, organizing and transforming, seeking information, and rehearsing and memorizing. Lastly, the motivation category includes self-evaluation reactions and self-consequences. Students’ answers are recorded for their frequency and students are also asked to rate their consistency using a particular strategy (Zimmerman, 2008).

These three measures of students’ self-regulatory strategies show them to be strongly correlated with measures of course performance (Zimmerman & Martinez-Pons, 1990). Additionally, the self-regulation strategies also predict students’ academic grades. In summary, these instruments helped to better assess students’ self-regulatory skills (Zimmerman, 2008). The instruments could measure and evaluate where students’ strengths and weaknesses were with regard to self-regulation strategies. With more clear information for educators on students’ backgrounds, a better understanding of solutions could be found to help students become more successful in school (Zimmerman, 2008).

Although the various models presented over the years of self-regulation differ, common threads have been found. All models incorporate at least three areas: 1. Goal-setting, 2. Planning, and 3. Monitoring (Wirth & Leutner, 2008). Given these
assumptions, self-regulated learning can be defined as “an active constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment” (Pintrich & Zusho, 2007).

**ADHD and Self-Regulation**

In the past decade, there has been a push to integrate the area of ADHD and self-regulation (Posner & Rothbart, 1998). When babies are born, they orient themselves to the environment which appears to act as a distress regulator the 1st year of life (Harman, Rothbart, & Posner, 1997). Then, as babies grow, there is a transition from babies reacting more to outside stimuli to actively controlling their attention (Rueda, Posner, & Rothbart, 2011). In other words, they move from simply reacting to outside stimuli towards choosing what to focus their attention on. This supports the position that there is voluntary control of action needed to control and regulate one’s behavior. Because attention and self-regulation were studied independent of each other for many years, little was known how these two areas integrate. But, research findings have begun to give clarity on how attention and self-regulation integrate (Kaplan & Berman, 2010; Kerns, Eso, & Thomson, 2010; Reid, Trout, & Schartz, 2005; Rueda, Posner, & Rothbart, 2011; Sarkis, Sarkis, Marshall, & Archer, 2005; Stevens, Quittner, Zuckerman, & Moore, 2002). There have been new theories about the specific neural mechanisms involved in self-regulation and
how they connect to executive attention and control (Rueda, Posner, & Rothbart, 2011).

Two important developments occurred that help educators better understand the integration of ADHD & self-regulation (Rueda, Posner, & Rothbart, 2011). The first development was in the combination of neuroimaging with electrical or magnetic recordings from outside the skull. This combination resulted in being able to see real time circuits computing sensory, semantic, and emotional response (Dale et al., 2000). This technology has been around for a long time; but it was in the last decade that progress had been made in better understanding how these areas integrate. The second big development was the sequencing of the human genome. This made it possible to study both the functional anatomy of brain networks and to also examine how genetic differences might lead to individual variations in the potential to acquire and perform skills (Rueda, Posner, & Rothbart, 2011).

More advances were made early on as Ruff and Rothbart (1996) attempted to integrate the study of attention and self-regulation. They found that through the developmental years, from infancy to childhood, there is a transition from a stimulus-driven form of attention to volunteer form of selection. Children were becoming cognizant of their attentional experiences and thus, they would begin to direct their attention towards those situations of their choosing (Rueda, Posner, & Rothbart, 2011).

One area where attention and self-regulation has been linked is in temperament or personality research. In this research, individual differences are
measured using questionnaires. A key concept that consistently emerges in this research is effort control. Effort control allows individuals to regulate their behavior (Rueda, Posner, & Rothbart, 2011). Their controlled behavior is in relation to current and future needs they are able to do this despite immediate rewards. The important point about this research related to the current study is that individuals can direct their attention to particular areas, self-regulate, and become more successful.

In addition to this research, Eisenberg and her colleagues found that 4-to 6-year old boys with good attentional control tend to deal with anger more effectively than those who do not have good attentional control (Eisenberg, et al,1994). Those with strong effort control were more likely to use non-hostile verbal methods rather than overt aggressive methods. The research has continued in this area by others with similar results, showing that effort control plays an important role in the development of conscience (Rueda, Posner, & Rothbart, 2011).

In summary, the research on effort control is a foundational component for the development from more reactive to more self-regulated behavior (Rueda, Posner, & Rothbart, 2011). It sheds light on how an individual’s attention can be directed to a more desired direction. Looking at the bigger picture from a student success standpoint, if a student with attentional challenges can more effectively have control of how they self-regulate, and thus control their attention and use it in more effective ways, the student can have more success in school, and in life.

To build upon the area of control, selecting information and controlling thoughts and actions and directing them in desired ways has been a major part of
attention in research findings behavior (Rueda, Posner, & Rothbart, 2011). When an individual interacts with the environment, attentional selection has an important role. Simple behaviors, such as reaching for an object, require selecting the stimulus and performing the action. Attention has to be directed in the area of selecting the object and moving forward to reach it. The same attention can be directed internally to coordinate memories, thoughts, and emotions (Rueda, Posner, & Rothbart, 2011).

Further research was conducted by Reid, Trout, and Schaart (2005) on the integration of self-regulation and ADHD. They conducted research on children based on the four common forms of self-regulation: 1. Self-monitoring, 2. Self-monitoring plus reinforcement, 3. Self-reinforcement, and 4. Self-management. Self-monitoring consists of observing and recording one’s behavior; self-monitoring plus reinforcement consists of self-monitoring steps plus reinforcement for desired behavior; self-reinforcement consists of an individual getting reinforced by targeted behavior; and self-management consists of an individual monitoring one’s behavior to an external standard or criteria (Reid, Trout, and Schaart, 2005).

The goal of the research was to instill self-regulated behavior and to determine if children who have ADHD can use self-regulated skills as an intervention. They found that self-regulated interventions can produce meaningful improvements in students for academic productivity, on-task behavior, and reduction of inappropriate behaviors (Reid, Trout, and Schaart (2005).
Executive Functioning, ADHD and Self-Regulation

The area of research conducted to date on ADHD and self-regulation that is the focus of this review is the area of executive functioning. Executive functioning is defined by Barkley (1997) as “the self-directed mental activities that occur during the delay in responding, that serve to modify the eventual response to an event, and that function to improve the long-term future consequences related to that event.” In other words, it is the self-directed behavior which will lead an individual to a particular destination. This area of research is important because concentration and focus is a key concern for students with ADHD. Executive functioning focuses on the actions students decide to take which ties directly with their outcomes. If students can become more focused and direct their attention to a more desired direction, they can become more successful in the classroom, leading to increased academic performance.

There are a number of self-regulation strategies students can use, involving higher levels of executive functioning, which will help them become more academically successful. This intervention is known as cognitive-behavior modification (CBM). Numerous studies have shown that CBM can help students focus more and control their behavior, thus leading to more success in school (Miranda, Presentacion, & Soriano, 2011; Reid, Trout, & Schartz, 2005).

Some important areas of cognitive-behavior modifications are: 1. Self-control and 2. Self-regulated learning, and 3. Self-monitoring. Self-control is behaviors associated with controlling one’s actions (Pintrich & Zusho, 2007). The goal is to
direct behavior in a way that will lead to higher levels of academic success. Self-regulated behavior is continually regulating one’s learning and understanding. Self-monitoring is a process where an individual observes and records his or her behavior (Mace, Belfiore, & Hutchinson, 2001). There are two types of self-monitoring which are self-monitoring of attention (SMA) and self-monitoring of performance (SMP). SMA is used to encourage an awareness of an individual’s attention to a required task (Reid, Trout, & Schartz, 2005). SMP interventions usually involve students performing an academic task and then self-monitoring its completion progress or accuracy of work.

Another area of behavioral modification is goal-setting and its relationship on helping students become more self-regulated (Gureasko-Moore, Dupaul, and White, 2011). Goal-setting is considered to be an important step for self-regulated performance. It has been implemented and validated as an important strategy for helping students with disabilities (Agran, Wehmeyer & Palmer, 2006). Students who can set goals are more likely to achieve them, and hence, have more success in school. Goal-setting is an important area of research that can help students with ADHD become more successful.

Lastly, a key behavioral modification for students is persistence. Students who persist on tasks have more success than those who do not (Pintrich & Zusho, 2007; Porath & Bateman, 2006). An important factor of a self-regulated learner is the ability to put forth effort and persist until the goal is accomplished.
ADHD, Self-Regulation & College Students

In order for a student to be successful in college, many skills are needed. The focus is on developing the whole student and many skills are necessary in order to accomplish this (Wolf-Wendel & Ruel, 1999). These include developing competence, managing emotions, and becoming more self-regulated. It is important that students become active agents in their own development, and become academically-focused and self-motivated (Wolf-Wendel & Ruel, 1999). This requires attention and concentration to reach one’s goal.

Students face many challenges in pursuing their college educational goals. One area of concern is students with ADHD. These students have challenges in attention and concentration, and therefore, they are less likely to succeed in school.

The research involving younger students with ADHD, elementary to high school, has found many ways to help them become more successful in school. These ways involve both medical and non-medical strategies. An important area that has been successful in treating students with ADHD, which is the focus of this study, is self-regulation strategies. A lot of research has been conducted on the elementary and high school population on self-regulation strategies that can help students with ADHD. However, the college population has not been examined in depth. Students with ADHD are underperforming in the educational system, and specifically at the college level. The outcome with regard to retention and graduation is alarming (McGoldrick & Wolf, 2006). Students with disabilities such as ADHD are more likely to pursue only a two-year degree instead of a four-year degree. Furthermore,
they are more likely to drop out prior to completing a degree. They may also be less likely to pursue post-graduate education than nondisabled peers.

A Department of Education National Center of Education Statistics report finds that only 4% of students with disabilities comprise graduate and professional student populations (McGoldrick & Wolf, 2006). This problem is severe and needs to be addressed. Helping students who have ADHD become more self-regulated learners is an important step to helping students become more successful inside and outside of the classroom (Reif, 2005).

This study will examine four self-regulation strategies and their relationship with college students with ADHD. The specific areas of self-regulation that will be assessed are: 1. Goal-setting, 2. Planning, 3. Monitoring, and 4. Perseverance. By assessing these four areas of self-regulation strategies, a better understanding of the relationship between self-regulation strategies and ADHD on college student’s life can be revealed. The goal is to understand the relationship between self-regulation strategies and ADHD on college students.
CHAPTER 3
RESEARCH METHODOLOGY

The purpose of this study is to examine the relationship between self-regulation strategies and ADHD on college students. Based on the research, self-regulation strategies can play a role in helping college students with this disorder. This chapter presents the methodology used in the study, including the research questions, research design, population and sample, instrumentation and reliability and validity information, demographic and background information, the procedure and data collections, and data analysis.

Research Questions

Based on the findings in Chapter 2, it is apparent that self-regulation does play a role in helping college students with ADHD. ADHD and self-regulation and their relationship to academic success have been studied extensively independent of each other, but not many studies have examined the relationship of self-regulation strategies on the success of college students with ADHD. The purpose of the study is to explore this area in more depth.

The following research questions are proposed for the present research investigation:

1. What role does self-regulation play in the learning experience of college students with ADHD compared to college students without ADHD?
2. What role does self-regulation play in the learning experience of college students with ADHD and without ADHD at a two-year college vs. four-year college level?

**Research Design**

The research question proposed is to get a better understanding of self-regulation strategies that can help college students with ADHD. The research design for the current investigation will use a case study approach and will utilize mixed methodologies. A survey will be used to get a baseline for students and then a semi-structured interview will be done. The analysis will be on meanings, themes, and general descriptions of experiences. The narrative approach will be to get the “essence” of each college student’s experience that has ADHD and how they self-regulate as students.

The research questions will focus on getting information on four key areas: 1. Goal-setting, 2. Planning, 3. Monitoring, and 4. Perseverance. Data is gathered from an interview by college students.

**Sample and Population**

The sample of students were chosen from three colleges, one being a four-year large urban college in Los Angeles, another being a medium four-year public college in Orange County, CA, and the last being a medium size two-year college in Orange County, CA. The goal was to compare self-regulation performance at different types of college settings. There were 16 students randomly selected from each college, eight being diagnosed with ADHD and eight not being diagnosed with...
ADHD. The student population is ethnically diverse at all three colleges. The students must be registered with the disabilities office as having ADHD to participate in the research. Participants were chosen randomly and through snowballing. Table 3.1 summarizes the frequencies of gender and ethnicity of the ADHD students.

Table 3.1

*Frequency of Gender and Ethnicity of the ADHD Students*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>n = 18</td>
<td>75%</td>
</tr>
<tr>
<td>Male</td>
<td>n = 6</td>
<td>25%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>n = 1</td>
<td>4.2%</td>
</tr>
<tr>
<td>Asian</td>
<td>n = 1</td>
<td>4.2%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>n = 11</td>
<td>45.8%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>n = 6</td>
<td>25%</td>
</tr>
<tr>
<td>Indian</td>
<td>n = 1</td>
<td>4.2%</td>
</tr>
<tr>
<td>Middle Eastern</td>
<td>n = 1</td>
<td>4.2%</td>
</tr>
<tr>
<td>Missing</td>
<td>n = 4</td>
<td>16.8%</td>
</tr>
</tbody>
</table>
The following table summarizes the frequencies of gender and ethnicity of the Non-ADHD students.

Table 3.2

*Frequency of Gender and Ethnicity of the Non-ADHD Students*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>n = 15</td>
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</tr>
<tr>
<td>Male</td>
<td>n = 9</td>
<td>37.5%</td>
</tr>
<tr>
<td>Ethnicity</td>
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<td></td>
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<tr>
<td>African American</td>
<td>n = 1</td>
<td>4.2%</td>
</tr>
<tr>
<td>Asian</td>
<td>n = 11</td>
<td>45.8%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>n = 2</td>
<td>8.3%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>n = 6</td>
<td>25%</td>
</tr>
<tr>
<td>Missing</td>
<td>n = 3</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
Table 3.3

*College Level, Year in College, Gender, Ethnicity and College GPA of the Students Without ADHD*

<table>
<thead>
<tr>
<th>NOADHD Students</th>
<th>Four or two year college level</th>
<th>Year in College</th>
<th>Sex</th>
<th>Ethnicity</th>
<th>College GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>4 PRI</td>
<td>Freshman</td>
<td>F</td>
<td>Asian</td>
<td>3.1</td>
</tr>
<tr>
<td>Participant 2</td>
<td>4 PRI</td>
<td>Freshman</td>
<td>F</td>
<td>Asian</td>
<td>3.8</td>
</tr>
<tr>
<td>Participant 3</td>
<td>4 PRI</td>
<td>Freshman</td>
<td>F</td>
<td>Caucasian</td>
<td>3.7</td>
</tr>
<tr>
<td>Participant 4</td>
<td>4 PRI</td>
<td>Freshman</td>
<td>M</td>
<td>Hispanic</td>
<td>3.8</td>
</tr>
<tr>
<td>Participant 5</td>
<td>4 PRI</td>
<td>Freshman</td>
<td>M</td>
<td>Asian</td>
<td>3.8</td>
</tr>
<tr>
<td>Participant 6</td>
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<td>F</td>
<td>Asian</td>
<td>3.8</td>
</tr>
<tr>
<td>Participant 7</td>
<td>4 PRI</td>
<td>Sophomore</td>
<td>F</td>
<td>Asian</td>
<td>3.9</td>
</tr>
<tr>
<td>Participant 8</td>
<td>4 PRI</td>
<td>Freshman</td>
<td>F</td>
<td>Asian</td>
<td>3.9</td>
</tr>
<tr>
<td>Participant 9</td>
<td>4 PUB</td>
<td>Sophomore</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 10</td>
<td>4 PUB</td>
<td>Senior</td>
<td>F</td>
<td>Hispanic</td>
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<td>4 PUB</td>
<td>Junior</td>
<td>M</td>
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<td>No Contact</td>
</tr>
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<td>Senior</td>
<td>F</td>
<td>African American</td>
<td>2.7</td>
</tr>
<tr>
<td>Participant 13</td>
<td>4 PUB</td>
<td>Junior</td>
<td>M</td>
<td>Asian</td>
<td>3.2</td>
</tr>
<tr>
<td>Participant 14</td>
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<td>Senior</td>
<td>M</td>
<td>No Contact</td>
<td>No Contact</td>
</tr>
<tr>
<td>Participant 15</td>
<td>4 PUB</td>
<td>Junior</td>
<td>F</td>
<td>Asian</td>
<td>3.4</td>
</tr>
<tr>
<td>Participant 16</td>
<td>4 PUB</td>
<td>Sophomore</td>
<td>F</td>
<td>Hispanic</td>
<td>3.7</td>
</tr>
<tr>
<td>Participant 17</td>
<td>2 CC</td>
<td>Sophomore</td>
<td>M</td>
<td>Asian</td>
<td>3.4</td>
</tr>
<tr>
<td>Participant 18</td>
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<td>Sophomore</td>
<td>F</td>
<td>Caucasian</td>
<td>3.2</td>
</tr>
<tr>
<td>Participant 19</td>
<td>2 CC</td>
<td>3rd</td>
<td>M</td>
<td>Hispanic</td>
<td>2.9</td>
</tr>
<tr>
<td>Participant 20</td>
<td>2 CC</td>
<td>4th</td>
<td>F</td>
<td>No Contact</td>
<td>No Contact</td>
</tr>
<tr>
<td>Participant 21</td>
<td>2 CC</td>
<td>Sophomore</td>
<td>M</td>
<td>Hispanic</td>
<td>3.7</td>
</tr>
<tr>
<td>Participant 22</td>
<td>2 CC</td>
<td>3rd</td>
<td>M</td>
<td>Hispanic</td>
<td>3.5</td>
</tr>
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<td>F</td>
<td>Asian</td>
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<td>2nd</td>
<td>F</td>
<td>Asian</td>
<td>3.9</td>
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</table>

*Note.* Four or two year college level (PRI = Private, PUB = Public College, CC = Community College); Sex (F = Female, M = Male)
Instrumentation

The current study investigates ADHD and self-regulation. Mixed methodology was used. For quantitative data, information was gathered using the Self-Regulations Questionnaire survey (SRQ). The Self-Regulation Questionnaire (Brown, Miller, & Lawendowki, 1999) was developed to assess self-regulatory processes through self-report and is in the public domain and may be freely used, adapted, reproduced without special permission. An interview was also conducted with 48 students, 16 from each college. Details of each of the instruments used are provided below.

Demographic Data

The demographic data was self-reported. All participants completed demographic and background information survey which included age, sex, ethnicity, and college GPA (Appendix F). In terms of sex, male was coded as 1 and female, 0. The ethnicity was coded as African American, 1; Asian, 2; Caucasian, 3; Hispanic, 4; and Others (Indian and Middle Eastern), 5.

Self-Regulation Instrument (SRQ)

Self-regulation was examined using an instrument of the Self-Regulation Questionnaire developed by Brown, Miller, and Lawendowski (1999) (Appendix, F). They developed the items to measure self-regulation behaviors in the seven sub-processes of the Miller and Brown (1991) model: (1) Receiving relevant information, (2) Evaluating the information and comparing it to norms, (3) Triggering change, (4) Searching for options, (5) Formulating a plan, (6) Implementing the plan, and (7)
Assessing the plan's effectiveness. The total items of the SRQ consists of 63. A 5-point Likert scale with the following scale points were used for the current study to score each item: 1–Strongly disagree, 2–Disagree, 3–Uncertain or Unsure, 4–Agree, and 5–Strongly Agree. Among the 63 items, 26 were reverse coded with the following scoring: 1=5, 2=4, 3=3, 4=2, and 5=1. The specific 26 items included 2, 3, 4, 5, 6, 8, 10, 12, 13, 15, 19, 20, 21, 24, 26, 29, 31, 33, 37, 40, 43, 45, 50, 55, 62, and 63. The Cronbach’s alpha of the current scale of the total of 63 was .86. The reliabilities of the subscales of the current study were also conducted. The Receiving relevant information subscale consisted of 9 items and the sample items were “Often I don't notice what I'm doing until someone calls it to my attention” and “I usually keep track of my progress toward my goals.” The Cronbach’s alpha of the current subscale was .65. The Evaluating subscale was comprised of eight items and the item number two was deleted as it was a poor item lowering the scale’s reliability. Its sample items included “I think a lot about how I'm doing” and “I don't care if I'm different from most people” and its Cronbach’s alpha was .61. The Triggering subscale was not included in this study because of its low reliability obtained with the current sample. Its reliability was not at the acceptable level showing much smaller than .60 after deleting one of the items in the subscale. The Searching subscale consisted of 9 items and its sample items were “There is usually more than one way to accomplish something” and “As soon as I see a problem or challenge, I start looking for possible solutions.” The Cronbach’s alpha of the current subscale was .68. The Formulating a plan subscale included 9 items and its sample items were
“I have trouble making up my mind about things” and “I have a hard time setting goals for myself.” Its Cronbach’s alpha was .77. The Implementing subscale consisted of 9 items and its sample items were “I have a lot of willpower” and “I am able to resist temptation.” Its Cronbach’s alpha was .65. The Assessing subscale was comprised of 8 items (e.g. “I set goals for myself and keep track of my progress” and “When I'm trying to change something, I pay a lot of attention to how I'm doing) and the item number 63 was deleted as it lowered the subscale’s reliability. Its Cronbach’s alpha was .66.

Table 3.4

Summary the Reliability of the Scale and its Subscales

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<td>Formulating</td>
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<td>Implementing</td>
<td>.653</td>
</tr>
<tr>
<td>Assessing</td>
<td>.658</td>
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</table>
Interview Questionnaire

Interviews were conducted with the students with ADHD and the students without ADHD over four weeks. A total of 48 students were interviewed, 24 ADHD and 24 Non-ADHD students. For each college, 16 students were interviewed, eight with ADHD and eight without ADHD. The interviewer advertised with fliers as well as used snowballing to recruit two types of undergraduate students: 1. Students diagnosed with ADHD, and 2. Students not diagnosed with ADHD. The interview consisted of two main sections: 1. Background interview including demographic and educational information and 2. Interviews on motivation strategies. The specific interview questions are listed in Appendix F. A few sample questions were “Do you set goals to help you succeed as a student? Probe: If so, what kinds of goals and have they worked for you?” and “Do you make specific plans to help you succeed as a student? Probe: If so, what kinds and do they work for you?”

Procedure and Data Collection

The researcher obtained IRB approval from the required institution and permissions from the disability office at the community college and four-year colleges to conduct interviews. The survey and interviews were completed during the first few weeks of the semester so students could acclimate to the school environment. Interview protocol was used to ensure reliability and validity (Creswell, 2009).

The researcher obtained participants from the disabilities office and through snowballing, and provided them with information on the research project (Appendix
D). He presented Information/Facts Sheet for Non-medical Research consent form (Appendix D), answered any questions that the potential participants addressed to receive student consent. Students were identified through their responding to an email from the disabilities office asking for volunteers. Additionally, to recruit more students, snowball sampling and additional referral steps were used. The researcher explained the purpose of the study and told the students that participation was both voluntary and confidential. Once the researcher briefly explained what the research was all about and obtained student consent, the students were interviewed and asked a series of 17 questions. Interviews were conducted two to three times, depending on the subject’s availability, over the course of two to three weeks. The interviews were conducted for 45 minutes to 1 hour on the participants’ campuses. Students were given $25 gift certificates for completing the interview. The researcher recorded the interview and took notes additionally (Creswell, 2009). To measure self-regulatory behaviors, the researcher also conducted a survey using the Self-Regulation Questionnaire for 20 minutes.

**Data Analysis**

The qualitative data analysis involved analyzing and interpreting the data to find important themes and information on the relationship of self-regulation strategies with college students’ success in college (Creswell, 2009).

**Qualitative Data Analysis Techniques**

The following steps recommended by Creswell (2009) were used to ensure valid and reliable data analysis of the student interviews. All interviews were
transcribed for extended analysis and coding using a professional transcribing service (Patton, 2002). Emerging themes were identified and categorized. Using the guided categories, the interview results were examined in student’s self-regulatory behaviors including goal setting, planning, monitoring, and perseverance. The interviews were also looked into in relation to academic success strategies, learning student success strategies, expectations for the course, examples of important learning events and beliefs on their performance in classes. The opening coding process produced the categories of the self-regulatory strategies that supported the student success in college. To control for the threats to internal validity, member-checking of the coding and themes was conducted. The themes were quantified to examine how many times a particular theme each participant used for their self-regulatory strategies. The most frequently used three to five themes were selected to be examined in details. Their percentage and frequency analyses were conducted for quantification of the themes using the SPSS 19.

**Quantitative Data Analysis Techniques**

For research question 2 regarding the examination of the students with ADHD at a two-year college level, only two themes were identified due to the fewer number of the students who were interviewed. Finally, the most employed themes were examined in relation to the quantitative results.

For the quantitative data analysis, a preliminary analysis was conducted to examine means, standard deviations and Pearson product correlations for the observed variables for all participants and the student group with ADHD. The
descriptive statistics including means and standard deviations were conducted for both the student group with ADHD and the student group without ADHD. To answer the research questions 1 and 2, ANOVA tests were run to examine the mean difference between the groups in self-regulation using the quantitative data. The subscales were also tested to examine mean differences between the groups in specific self-regulation strategies. The model of ANOVA may be defined as:

- \[ Y_{ij} = \alpha_i + \varepsilon_{ij} \]

- \( Y_{i} \) is the vector of observations for group \( i \) on Self-regulation/ Receiving /Evaluating/Triggering/Searching/Formulating/Implementing/Assessing

- \( \alpha_i \) is the effect of group \( i \);

- \( \varepsilon_{ij} \) is the experimental error.

**Summary**

Two research questions will guide this study taking place at three different college environments including students with and without ADHD. The results will be presented in the following chapter.
CHAPTER 4

RESULTS

This chapter presents statistical and qualitative findings to answer the following research questions:

1. What role does self-regulation play in the learning experience of college students with ADHD compared to college students without ADHD?

2. What role does self-regulation play in the learning experience of college students with ADHD and without ADHD at a two-year college vs. four-year college level?

Preliminary Analysis

Intercorrelations with All Participants

Intercorrelations between all variables were examined using Pearson Product Correlations for the student group with ADHD and the students without ADHD. The means, standard deviations, and correlations of demographic variables, achievement score, self-regulation and its subscales are listed in Table 4.1. The group was negatively related to Grade Point Average (GPA), $r = -0.39$, $p < .05$, designating that the student group without ADHD were more likely to have higher GPAs than those with ADHD. The group was also related to self-regulation, $r = -0.29$, $p < .05$, indicating that the students without ADHD showed higher self-regulatory behaviors than their counterparts. Ethnicity was negatively correlated to GPA, $r = -0.38$, $p < .05$. This means that Hispanic, Indians and Middle Eastern students had lower GPA than Asian and Caucasian students. Except for the evaluating subscale, the others were
highly correlated with the self-regulatory scale: receiving, $r = .70$, $p < .01$; searching, $r = .74$, $p < .01$; formatting, $r = .87$, $p < .01$; implementing, $r = .77$, $p < .01$; and assessing, $r = .75$, $p < .01$. The receiving subscale was significantly correlated with all subscales except for the evaluating subscale: searching, $r = .33$, $p < .01$; formatting, $r = .68$, $p < .01$; implementing, $r = .42$, $p < .01$; and assessing, $r = .35$, $p < .01$. The searching subscale was significantly related to formatting, $r = .55$, $p < .01$, implementing, $r = .41$, $p < .01$, and assessing, $r = .48$, $p < .01$. The formatting subscale was significantly correlated to implementing, $r = .63$, $p < .01$ and assessing, $r = .62$, $p < .01$. The implementing subscale related to assessing $r = .65$, $p < .01$. The self-regulatory behavior, particularly evaluating the information and comparing it to norms did not relate to receiving relevant information, $r = -.24$, $p > .05$; searching for options, $r = .06$, $p > .05$; formulating a plan, $r = -.22$, $p > .05$; implementing the plan, $r = -.09$, $p > .05$; and assessing the plan's effectiveness, $r = -.12$, $p > .05$. 
Table 4.1

*Means, Standard Deviations, and Pearson Product Correlations for Measured Variables*

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*Note.* Group (1 = Students with ADHD, 0 = Students without ADHD); Ethnicity (African American = 1, Asian = 2, Caucasian = 3, Hispanic = 4, Others (Indian and Middle Eastern = 5) Sex (1 = Male, 0 = Female); GPA = Cumulative Grade Point Average; Class = Year in school (1 = Freshman, 2 = Sophomore, 3 = Junior, 4 = Senior); College Years (Four years college =1, two years college = 0); TSR = Total mean of self-regulation

*p < .05. **p < .01. ***p < .001.*
Table 4.1, continued

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</table>
Intercorrelations with ADHD Students

This section summarizes the intercorrelations between all variables with the students with ADHD. The means, standard deviations, and correlations of demographic variables, achievement score, self-regulation and its subscales are listed in Table 4.2. The self-regulatory scale was significantly related to all subscales except for the evaluating subscale: receiving, \( r = .75, p < .01 \); searching, \( r = .77, p < .01 \); formatting, \( r = .89, p < .01 \); implementing, \( r = .77, p < .01 \); and assessing, \( r = .79, p < .01 \). The receiving subscale was significantly correlated with the following subscales: formatting, \( r = .69, p < .01 \) and implementing, \( r = .45, p < .01 \). The searching subscale was significantly related to formatting, \( r = .70, p < .01 \), implementing, \( r = .43, p < .01 \), and assessing, \( r = .58, p < .01 \). The formatting subscale was significantly correlated to implementing, \( r = .73, p < .01 \) and assessing, \( r = .64, p < .01 \). The implementing subscale related to assessing \( r = .71, p < .01 \). Evaluating the information and comparing it to norms did not relate to receiving relevant information, \( r = -.19, p > .05 \); searching for options, \( r = .28, p > .05 \); formulating a plan, \( r = -.36, p > .05 \); implementing the plan, \( r = -.37, p > .05 \); and assessing the plan's effectiveness, \( r = -.22, p > .05 \).
Table 4.2

Means, Standard Deviations, and Pearson Product Correlations for Measured Variables

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*Note. Ethnicity (African American = 1, Asian = 2, Caucasian = 3, Hispanic = 4, Others (Indian and Middle Eastern) = 5) Sex (1 = Male, 0 = Female); GPA = Cumulative Grade Point Average; Class = Year in school (1 = Freshman, 2 = sophomore, 3 = Junior, 4 = Senior); College Years (Four years college = 1, two years college = 0); TSR = Total mean of self-regulation

*p < .05. **p < .01. ***p < .001.
Table 4.2, continued

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<tr>
<td>3. GPA</td>
<td>3.12</td>
<td>.66</td>
<td>-.20</td>
<td>-.07</td>
<td>.02</td>
<td>.04</td>
<td>.03</td>
</tr>
<tr>
<td>4. Class</td>
<td>2.88</td>
<td>1.19</td>
<td>.59**</td>
<td>.26</td>
<td>-.11</td>
<td>-.04</td>
<td>.15</td>
</tr>
<tr>
<td>5. College Years</td>
<td>.67</td>
<td>.48</td>
<td>.24</td>
<td>.31</td>
<td>.13</td>
<td>.28</td>
<td>.49*</td>
</tr>
<tr>
<td>6. TMSR</td>
<td>3.47</td>
<td>.33</td>
<td>-.10</td>
<td>.77**</td>
<td>.89**</td>
<td>.77**</td>
<td>.79**</td>
</tr>
<tr>
<td>7. Receiving</td>
<td>3.33</td>
<td>.55</td>
<td>-.19</td>
<td>.40</td>
<td>.69**</td>
<td>.45*</td>
<td>.39</td>
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<tr>
<td>8. Evaluating</td>
<td>3.38</td>
<td>.44</td>
<td>----</td>
<td>.28</td>
<td>-.36</td>
<td>-.37</td>
<td>-.22</td>
</tr>
<tr>
<td>9. Searching</td>
<td>3.83</td>
<td>.47</td>
<td>----</td>
<td>.70**</td>
<td>.43*</td>
<td>.58**</td>
<td></td>
</tr>
<tr>
<td>10. Formatting</td>
<td>3.24</td>
<td>.64</td>
<td>----</td>
<td>.73**</td>
<td>.64**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Implementing</td>
<td>3.33</td>
<td>.55</td>
<td>----</td>
<td>----</td>
<td>.71**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Assessing</td>
<td>3.61</td>
<td>.44</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Research Question 1

Quantitative Results

To examine what role self-regulation played in the learning experience of college students with ADHD, an ANOVA was performed. The difference in self-regulation between the students with ADHD and the students without ADHD was examined. The results of the analysis showed that there was a significant mean difference in self-regulation between both groups, $F(1, 47) = 4.353, p < .05$. This result indicated that the students without ADHD presented a mean of 0.1931 more than its counterparts with ADHD. The means and standard deviations of both groups are summarized in Table 4.3.

Table 4.3

ANOVA: the Students With ADHD (N=24) and the Students Without ADHD (N=24)

| Dependent Variables | Students with ADHD | | Students without ADHD | | | | | | | |
|---------------------|--------------------|-------------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Mean                | 3.468              | .3326             | 3.661                 | .308              | 47                | 4.353             | $p < .05$         |                   |

Note. Independent Variables = groups, students with ADHD and students without ADHD; Dependent Variables = Self-Regulation; SD = Standard Deviation
In addition, sub-analyses were conducted to examine mean differences in specific self-regulation strategies between these two groups in the following constructs: receiving, evaluating, searching, formatting, implementing and assessing. The results of the analysis showed that there was a close to a significant mean difference in receiving between the two groups, $F(1, 47) = 3.828$, $p = .056$. The means in both groups in receiving follows as students with ADHD, 3.333 and students without ADHD, 3.639. According to the results of the rest of the analysis, there were no significant mean differences in the other subscales between the observed two groups: evaluating, $F(1, 47) = .139$, $p = .711$; triggering, $F(1, 47) = .333$, $p = .566$; searching, $F(1, 47) = 2.601$, $p = .144$; formatting, $F(1, 47) = 3.323$, $p = .75$; implementing, $F(1, 47) = 1.971$, $p = .167$ and assessing, $F(1, 47) = 1.499$, $p = .227$. The students without ADHD presented higher means in all these subscales than their counterparts. The means and standard deviations of both groups in all observed subscales are presented in Table 4.4.
Table 4.4

*MANOVA: the Students With ADHD (N=24) and the Students Without ADHD (N=24)*

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Students with ADHD</th>
<th>Students without ADHD</th>
<th>DF</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving</td>
<td>3.333 (.549)</td>
<td>3.63 (.533)</td>
<td>47</td>
<td>3.828</td>
<td><em>p = .056</em></td>
</tr>
<tr>
<td>Evaluating</td>
<td>3.380 (.441)</td>
<td>3.431 (.504)</td>
<td>47</td>
<td>.139</td>
<td><em>p = .711</em></td>
</tr>
<tr>
<td>Triggering</td>
<td>3.546 (.357)</td>
<td>3.607 (.365)</td>
<td>47</td>
<td>.333</td>
<td><em>p = .566</em></td>
</tr>
<tr>
<td>Searching</td>
<td>3.829 (.474)</td>
<td>4.047 (.461)</td>
<td>47</td>
<td>2.601</td>
<td><em>p = .144</em></td>
</tr>
<tr>
<td>Formatting</td>
<td>3.241 (.640)</td>
<td>3.560 (.591)</td>
<td>47</td>
<td>3.323</td>
<td><em>p = .750</em></td>
</tr>
<tr>
<td>Implementing</td>
<td>3.329 (.555)</td>
<td>3.565 (.609)</td>
<td>47</td>
<td>1.971</td>
<td><em>p = .167</em></td>
</tr>
<tr>
<td>Assessing</td>
<td>3.616 (.443)</td>
<td>3.773 (.447)</td>
<td>47</td>
<td>1.499</td>
<td><em>p = .227</em></td>
</tr>
</tbody>
</table>

*Note.* Independent Variables = groups, students with ADHD and students without ADHD; Dependent Variables = Self-Regulation; SD = Standard Deviation
In the observation of the means of all self-regulation strategies, searching behavior was found to show the highest mean for both groups.

**Qualitative Results**

There were 48 participants interviewed at three colleges, 16 at each college. Eight participants were diagnosed with ADHD and eight participants were not diagnosed with ADHD. The age range of participants was ~18-22 years old. The goal was to interview each participant and learn more about the role self regulation strategies played in their academic success.

**Self-regulatory strategies used by the students with ADHD.**

This section focuses on discussing the findings for the qualitative data. According to the outcomes of the interview data analysis, five emerging themes of self-regulation strategies were identified for the students with ADHD: (1) goal setting, (2) perseverance, (3) keeping records/notes, (4) monitoring, and (5) planning and seeking assistance/information from professors. The other identified themes included organizing, reviewing materials, seeking assistance/information from peers, evaluation, time management, checking goals, previewing texts/materials, and seeking help from parents and TA’s. The five major emerging themes, their percentages, and frequencies are summarized in Table 4.5.
Table 4.5

*Emerging Themes, Percentage, and Frequency (N=22)*

<table>
<thead>
<tr>
<th>Themes</th>
<th>Percentage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Goal-setting</td>
<td>90.9</td>
<td>20</td>
</tr>
<tr>
<td>2. Perseverance</td>
<td>90.9</td>
<td>20</td>
</tr>
<tr>
<td>3. Keeping records/notes</td>
<td>77.3</td>
<td>17</td>
</tr>
<tr>
<td>4. Monitoring</td>
<td>59.1</td>
<td>15</td>
</tr>
<tr>
<td>5. Planning</td>
<td>59.1</td>
<td>13</td>
</tr>
<tr>
<td>6. Seeking assistance</td>
<td>59.1</td>
<td>13</td>
</tr>
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</table>

*Goal setting.*

Setting long-term and short term goals was the most often used self-regulatory strategy of college students with ADHD. This was a self-regulation strategy the participating students used to help them understand classes and accomplish their tasks. The following student described his learning experience in relation to goal settings such as completing classes and more importantly to understand classes. The main goals of some of the other students included passing classes, getting degrees and getting grades they aimed for. A student from a four year private college stated that she knew that she could not obtain A’s for all classes, but she established goals that she could accomplish such as learning and passing the courses:
Well, if I had an academic goal it would be to pass my classes, but more importantly, to understand. Because I'm pretty sure I'm not going to win every class. I'm not going to get an A in every class. I try to accept that without feeling defeated, because I feel like that.

It was also found that the ADHD students set long term goals while they studied in college and employed their self-regulatory behavior to support their obtaining a Master’s degree or careers in the future. It was found that they set their short term goals in a degree that they could achieve rather than putting too high of expectations in their learning and academic success. Another student from a four year private college stated that his short term goal was to complete classes and long term goal was to get a master’s degree. The student pointed out that current goal was just completing classes, “Goals, the goals that I set is just finishing my classes at a time.” His long term goal was to study counseling in graduate school because he wanted to get the degree. “Long-term goals are what my requirements are. I want to get my masters in counseling.” This student had a long-term goal stronger than a short term goal that allowed him to become more motivated in school. In addition, another student from a four year private college set a target grade and his academic goal seemed to be static, “I just want a C. I just shoot for a C. I do better sometimes, but that's my goal.” He stated that he did not readjust his grade goal over the course of taking the class because of the difficulty of school. “It's hard. School's hard. Generally just passing is my goal. Sometimes I exceed it, but it's not knowingly.” His short term goal was simply to get a C or above and this is where his motivation was.
Another student stated that her initial goal was to master the concepts because she liked to learn. Her goal was changed with her perception on the difficulty of getting better grades or maintaining the current grades as she stated getting higher grades to be an important goal that she needed to achieve with better study skills:

Inherently the learning goal is to appreciate the concepts and content. Like I like reading. I like learning. I like analyzing. I think it should be more to get the grade, because I feel like that's what I've always been lacking. I think I've gotten by on the fact that I'm decent with content and teachers like me, so that's why I get B's. But really to get A's and to keep getting B's at this point because it gets more difficult, you need to have better study skills.

This student had goals that included going beyond getting a letter grade, but mastery of content. There were both internal and external motivational factors. The goal setting self-regulation strategy played an important role influencing the ADHD students’ learning experience, and students’ outcome and shaped how they currently performed in the educational system.

**Perseverance.**

The second most used self-regulatory strategy by ADHD students was perseverance. Perseverance is a characteristic of self-regulation strategies as it shows students’ commitment to accomplish tasks and reach their desired goal. A student indicated that he persevered to complete a task in balance with other activities rather than focusing on one particular task in response of what made him stay on track and if he was disciplined:
I feel like I do what I have to do when I need to do it. I can slip up one day and choose to do something else when I should have been studying, but then I’ll fix that the next day.

Some students commented that they persevered on particular tasks if it was related to their value. A student was able to get an A in a dance class because it was a hobby for her so she continued to do it compared to her other classes; she valued dance more than her other coursework: “Persevered. I would say dance. When I took the dance class, it was really easy for me, because it was more like a hobby for me and I basically ended up with an A in that class.”

Another student also pointed out that he spent a lot of time learning in some classes that he was interested in:

There’s some classes where a week into it, I think “Oh, this is really interesting. I would like to learn this and I would like to really spend a lot more time learning this because I’m interested in it.”

Another student pointed out that he persevered in school work because of its utility value in order to graduate college and get a job: “If I was to give up, it'd probably be totally to not do college, because I'm like totally over school at this point, but I know I have to do it to get a job that pays. So I guess.”

A student also persevered in classes up to the point that he could not do anything more to raise his grades: “Last year, I tried my best to raise my grades in my classes and somehow it didn't really work out, so I kind of gave up in one of my classes. So that's an example.”
Keeping records/notes.

The third commonly used self-regulatory behavior of the student participants with ADHD was keeping records and notes. Students were shown to have this self-regulation behavior which enabled them to be more successful in their classes. A student described taking note as an active process of learning strategy, particularly with detailed notes:

Definitely note taking. Outside of class reading textbooks. Outlining is big for me. Even if I outline… writing things down even if I don’t read over them later, just the active process of taking really detailed notes works for me.

Another student used a flashcard to write the term that he learned in class and also made notes at home:

I would also take notes on a flashcard and I would study that. I would write the term on one side and then write the definition on the other or maybe just a phrase or two on that. Otherwise, another one would be taking my own notes at home.

Another student pointed out that she learned from writing it out and taking notes what was useful to prepare for the test and to recall what she learned in class:

I learn from writing it out. Because then when you go back to the test, I kind of have a photographic memory. So when I'm writing it, I'm like oh that's what I wrote. I can kind of see what I wrote or know the letters I formed.

Monitoring.

The fourth self-regulatory strategy that the students with ADHD most often used was monitoring. This is a self-regulation strategy that helps students stay on track and evaluate if what they are doing is effective or not. A student checked self-effectiveness on tasks and made an effort to accomplish them:
I’ll go to junior college. I ended up going to junior college, but I was upset with myself that I didn’t push myself after the fact. So that was a failing time for me. But it was also a realization, this was not like… “Alright, now that I messed up here. Now I’m going to make sure I know for the rest of my time in school.” And that’s what I did.

Another student used a performance based monitoring for grades since she perceived that grades were important for graduate school:

I think that I used... I don't know. It's just been recently that I care about grades. So I think I monitor how I'm doing on grades a lot more in grad school, I think there's a huge emphasis on grades, so it kind of just evolved.

Another student monitored and evaluated how he did on tasks when he had time to examine his performance and was cognitively less overloaded:

When I have free time. Like over Christmas break this year, it was like the most free time ever. That’s when I take the time to look at how am I doing, how am I succeeding, like what are my bigger plans. And look at that and how I want to do it differently. But I feel like when things are getting really busy, things are just day-by-day, I have to do what I have to do to get by.

Planning.

The fifth self-regulatory strategy the participating students most commonly used was planning. This is a self-regulation strategy that enables students to accomplish their short and long term goals by knowing what they want and then putting a plan together to make it happen. A student incorporated planning with the monitoring of his grade. He planned to keep or raise his current grades by evaluating his performance:

I know for me, I usually try as extra credit assignments come up, I try to do them, because I'm like okay, if I screw up later, I'm going to have those to back me up a little bit. So I guess that's a little bit of a plan. I try and keep the
scores in my grade, and go now I have to study really hard to get this grade to keep my grade as it is.

Another student employed a time management strategy to have a better plan by allocating time to do things:

I feel like I’ve always done what works and it’s always worked for me. I just do things as they come along. I know how much time things are going to take for me. I know this will take me two days, so I will do it two days before it is due.

A student pointed out that planning depended on the work demands of his courses. If he evaluated that a certain class would be challenging, he planned to study harder. If he had high confidence with a particular class, he planned to make less effort. His planning was closely associated with his plan for success in his classes:

It all depends on what the course is. If you go into a course where it's like oh god, I've heard this course is going to be hard, then I expect it to be, then I expect oh I should be studying this much. But when it comes down to it, what do I normally do? I normally don't study as much as I should. I barely scratch by in some classes.

Seeking assistance and information from professors.

The other self-regulatory strategy students used most was seeking assistance and information from professors. Students showed this self-regulation strategy by getting input when necessary and then moving forward with their goals. According to the results on other types of seeking assistance and information, the students got help from peers, parents, TAs, siblings and others. When all different types of seeking assistance and information were examined, the most highly used self-
regulatory strategy by the observed students with ADHD was seeking help from others. It was found that each student showed different sources to get assistance and information.

As a success strategy, a student sought assistance and information from a TA or professor with a variety of issues including lack of understanding of course content, peer insults, and course failure:

Definitely if you have questions make sure to ask them. They’re not going to answer themselves. I go to the TA if I need help with anything. They’re usually more than willing to help. Go to the professor if you have a question with the professor or you don’t understand something or you have a problem with the class, and you feel like it’s going off course or they insulted you in some way, then you have to make sure you communicate that. Because otherwise you’re never going get information or say what your feelings are.

A student found that seeking concrete feedback from professors was very effective in having higher performances in classes:

Like in the beginning I was doing poorly on the short answers in my classes last semester, because I wasn’t used to the caliber of what they wanted here yet. And then I was like, “Oh. Reality check.” So then I went to the teacher and was like, “Tell me how you want me to do this, like what exactly do you want?” And then I changed my whole entire way. I wrote based on what she wanted and I ended up getting full credit on all of them.

**Self-regulatory strategies used by the students without ADHD.**

For the students without ADHD, five emerging themes of self-regulation strategies were identified as: (1) perseverance, (2) goal setting, (3) monitoring, (4) planning and (5) evaluating. The other identified themes included keeping records/notes, organizing information, seeking assistance from professors and peers, time management, checking goals over the course, memorizing, rehearsing,
previewing, seeking assistance from parents, modeling professor, and mapping out activities. Table 4.6 presents the five major emerging themes, their percentages, and frequencies.

Table 4.6
Emerging Themes, Percentage, and Frequency (N=20)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Percentage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perseverance</td>
<td>90</td>
<td>18</td>
</tr>
<tr>
<td>2. Goal setting</td>
<td>85</td>
<td>17</td>
</tr>
<tr>
<td>3. Monitoring</td>
<td>80</td>
<td>16</td>
</tr>
<tr>
<td>4. Planning</td>
<td>75</td>
<td>15</td>
</tr>
<tr>
<td>5. Evaluating</td>
<td>60</td>
<td>12</td>
</tr>
</tbody>
</table>

Perseverance.

The most frequently used self-regulatory strategy of the student participants without ADHD was perseverance. When distractions came, the students finished the things which were already in their plan and then they went with their distractions.

A student indicated that she persevered to complete a task because of the importance of it as well as its utility value. In this instance, a student accomplished her goal of persevering to get into college. With her plan for getting into a college in China, first she recognized the importance of passing the exam. She stopped
pursuing the examination only when she accomplished her goal of getting into another university:

Q. Are you a student who perseveres until you succeed or do you give up? Can you elaborate on when you persevered and when you failed?

A. I gave up? When I decide to go abroad for university, you know there is like entrance examination in China that is very important and very hard. At first, I decided to participate in that examination, but then I got an offer from USC and then I gave it up. Because it doesn’t matter to me anymore.

A student in this example shows perseverance to get an A in his class by going beyond what is expected. In addition, his perseverance behavior was associated with his interest in the topic that the course presented, thus showing a self-regulation strategy. He set a high expectation for his performance and made a continuous effort for successful outcomes. Through this process, he was able to get the grade he wanted and feel a sense of accomplishment:

I have a good example of that I think. When I took a writing class here last year, I had a really interesting topic that I was really into and I decided I wasn't going to be happy with my project in that class unless I kind of went over and beyond what the expectations were. And I ended up making a video and really dedicating a lot of time to it and I felt like, "Yes, I got the A." because I put in so much work. But I also, just felt very successful in my pursuits in what I wanted and what I ended up getting.

The following case also presented that the perseverance behavior was related to interest. A student in this example decided not to persevere in the class because it was not interesting to him. He did not like the teacher and perceived the class to be boring. As a result, he did not want to deal with the class tasks:

I took a neuroscience class last semester actually; this was probably one of my biggest the only time I've given up in grad school. And we had a midterm that was 50 percent of our grade and I did not like the teacher or class and it
was the most mundane, boring, non-exciting class I've ever been in and we had a midterm and it was 50 percent of our grade and I just decided I was going to wing it. And it wasn't that I couldn't have studied, it was that it was a huge mountain of stuff that I had to study and I started looking through it and I didn't want to do it. I gave up right then.

Some student participants from China pointed out that one construct of their motivation to persevere with their academic tasks in their current schools in the United States was because of family expectations, support and obligations and appreciation to responses by their parents’ support and understandings. The following example was from a student who persevered in response to her family orientation and background. When she felt cognitively overloaded with multiple tasks that she had to deal with by herself as a foreigner, she wanted to give up her college aspirations in the United States. She was motivated to pursue her learning at a college in the states because of the support and encouragement of her family:

Last semester, towards the end of the first semester in college you get stressed when all the finals come, and living alone in the other country, I always feel that out of support sometimes, so I really wanted to give up. I told my parents that how about I try to transfer to a college back in China, and because I can’t take it anymore. It’s too much work here. You have to concentrate not only on studying but other relationships with all sorts of people, looking for housing, all the miscellaneous things. But my parents, they didn’t say anything bad to me. They just tried to comfort me. And they said, “Well, whatever you’re going to decide, we’re going to support you anyways.” So I felt really bad to give up, because my parents they were so nice to me. They not only support me financially – It’s a lot of money to go to college – they just always think of me as such a good daughter and they tell their friends how good I am all the time. And I thought, “I can’t be just so cowardly and just to give up and go back home,” because I know if stay here and finish college and maybe work a little after graduation.
**Goal setting.**

The second most commonly employed self-regulatory behavior used by participants was goal setting. Goal setting is an important step students without ADHD take to become successful in school. This particular student set goals without specifying them, but knowing the direction he wanted to move his life in:

Yes, I do. I set goals, not that specific. But I do know I always want to push myself to be one of the best students in my class. And that’s a really general goal. So that’s kind of it.

Another student allocated time to accomplish his goals. He was task oriented with the goal of going to professor’s office hours:

I do like go to professor’s office hours. Probably I will tell myself two times a month. And if it’s a hard class, at least leave one hour for reading every day for that class. And I would say these are short-term, really, really short-term.

Another student developed goals based on the courses she was taking. For particular classes, she had goals of mastery of content because some courses were related to her future goals. For other courses, not related to her profession, she simply had the goal of enjoying the class. Her goals were also based on her ability to network:

For primary goals, it also depends on classes. Like for the classes, I’m taking accounting, yoga, golf and two GE classes. For accounting, I really wish to know the content, know the concept, build network with professors, because I want to be an accountant in the future. I know that’s going to be in my future career-wise, and I take it really, really seriously. And for goals for yoga, I’m just taking it for fun. I don’t really care. I’m just taking it for fun. I just want to relax and stretch a little bit. And for golf, it’s useful for business occasions, and I kind of want to have something to talk when if in the future my boss asks me to go play with him to play golf, I kind of want to at least be able to hit the ball. Not be really, really bad. That’s kind of a network thing. I don’t really care how well I do as an athlete. It really depends on what kind of course it is.
**Monitoring.**

Monitoring was the third most used self-regulatory behavior by the students without ADHD. Students used monitoring to evaluate their performance, make adjustments, and keep on track with their goals. Students tended to monitor their academic success with their grades. Previously, when he met some challenges, difficulties, something he didn’t understand, his action was to solve the problem immediately, or as soon as possible. However, the following student pointed out that since graduate schools emphasized grades, he cared about and monitored his grades. This behavior was found to be performance-based monitoring in response to the external motivational factors such as his perception on the graduate school expectation:

I think that I used... I don't know. It's just been recently that I care about grades. So I think I monitor how I'm doing on grades a lot more in grad school, I think there's a huge emphasis on grades, so it kind of just evolved.

Another student evaluated and monitored areas such as if a class was right for him, if he should seek more help for the professor and TA, and the level of difficulty:

I would say that if I get two not that good grades in a row, I would think, “Is this the right class for me or am I working the right way or should I talk to the professors or TA’s for a little bit?”

Another student monitored his performance, reset his goals, and persevered until he was successful:

Well, last semester I took a class, and I thought it was going to be really interesting and not that hard at first. And it turned out there were a lot of readings, and probably because of background differences or something it was really hard to keep up. So at first I didn’t really get good grades then as I expected, then I changed my goals to just to keep up with the class and to do
the readings and to see improvement, so as long as I see myself improving in that class. For example, I was not able to talk much before, but now I’m definitely 100 percent comfortable just to be in that class and to know the materials. Then I will think I am successful. I have succeeded at least.

This particular student analyzed his weaknesses and the made adjustments. He monitored his situation and then addressed the problem so that he could have a positive outcome:

I will definitely go back to the exam and see what is the problem, like what type of questions I usually lose points on and I attack those weaknesses?

Lastly, another student monitored his grades and used a benchmark to evaluate his performance:

JH: So would you say you're aggressive with your monitoring? Some people are on top of their monitoring. Some people just really don't monitor that much.

DH: I guess it's just after exams. Every time after grades, after I get my grades, I see what's going on, am I doing well and bad.

Planning.

Planning was the fourth self-regulatory behavior that the students without ADHD used most frequently. One student got an understanding of when the exams were and the best way to prepare for them whether it was by reading his books or notes, or reviewing quizzes:

It’s like for when is the exam, what is the exam then when you begin to prepare for it. Sometimes you begin from the books, just reading the books. Sometimes you begin just reading the notes or have a look at the quizzes.

Another student had a time management system for planning. He allocated his time appropriately so that he could reach his goals:
I have the weekly schedule. I have the booklet with me everyday, so I can write down my schedule everyday. And typically I try to get up earlier in the morning, just not to waste a lot of time, because I thinking sleeping is sort of a waste of time. So, and what else? I also put the time of the board meetings on my schedule as well, because I’m in a lot of clubs, so it’s kind of overwhelming if you don’t keep track with them, so I put them on my schedule. They are typically at night, so that takes a lot of my time at night. So I tend to study in the afternoon because most of my classes get out early. So I study and finish my homework in the afternoon. And I try to finish my homework as soon as I get out of class if possible. Like I just finished my German homework after I get out of the class in case I forget about it.

**Evaluating.**

The last theme that the students without ADHD used was evaluating behavior. The students evaluated their performance as a way to make them become successful as students. This is a self-regulation skill set enabling students to become more successful. One student evaluated his performance after an exam and if he did poorly, he learned from the experience and made improvements next time:

Yeah I think if I get a B, it will alert me to reflect what I’m doing is it a habitual mistake or am I not receiving the material I should have. So that will make me think, and I will just reassess my attitudes or something.

Another student evaluated his grades making sure his performance was acceptable. This is a way for him to evaluate the level of difficulty of classes, “I am mainly on track, I check on my grades, making sure the percentages are good. It kinda gauges how hard I tried in class.”
Research Question 2

Quantitative Results

To examine what role self-regulation played in the learning experience of college students with ADHD at a two-year college, four-year public college, and four-year private college level, an ANOVA was performed. The mean difference in self-regulation behavior between the students with ADHD and the students without ADHD at the three different college levels was examined. According to the results of the analysis, a significant mean difference was not found in self-regulation between the groups, $F(1, 22) = 2.466, p = .131$. Table 4.7 summarizes the means and standard deviations of both groups.

Table 4.7

Descriptive Statistics of Students With ADHD at a Two-Year College vs. Four-Year College Level – Self-regulation

<table>
<thead>
<tr>
<th>Dependent</th>
<th>Students at a two-year college</th>
<th>Students at four-year college</th>
<th>DF</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Regulation</td>
<td>3.321, .334</td>
<td>3.541, .318</td>
<td>22</td>
<td>2.466</td>
<td>.131</td>
</tr>
</tbody>
</table>

Note. Independent Variables = groups, students at a two-year college and students at four-year college; Dependent Variables = Self-Regulation; SD = Standard Deviation
In addition, according to sub-analysis including scales of receiving, evaluating, searching, formatting, implementing and assessing, there was a significant mean difference in assessing between the two groups of the ADHD students, $F(1, 22) = 5.211, p < .05$. The ADHD students at the four-year college level had .403 more mean than its counterparts at the two-year college level. The results of the rest of the analyses indicated that there were no significant mean differences in the other subscales.

Table 4.8

*Descriptive Statistics of Students With ADHD at a Two-Year College vs. Four-Year College Level – Assessing*

<table>
<thead>
<tr>
<th>Dependent</th>
<th>Students at a two-year college</th>
<th>Students at four-year college</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Assessing</td>
<td>3.348</td>
<td>.322</td>
</tr>
</tbody>
</table>

*Note.* Independent Variables = groups, students at a two-year college and students at four-year college; Dependent Variables = Self-Regulation; SD = Standard Deviation

In the examination of the means of all self-regulation strategies, searching behavior was found to show the highest mean for both groups. The ADHD students at a two-year college level had the lowest mean in formatting behavior than those at four-year college level.
Qualitative Results

This section revealed the findings of qualitative data using the analysis of interviews. The results of the analysis present four emerging themes of self-regulation strategies for the student groups with ADHD at a two-year college vs. four-year college level.

Students with ADHD at a four-year college level.

The four most frequently used themes were found to be: (1) goal setting, (2) perseverance, (3) planning and (4) keeping records and notes. Table 4.9 presents the four major emerging themes, their percentages, and frequencies.

Table 4.9

Emerging Themes, Percentage, and Frequency (N=17)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Percentage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Goal setting</td>
<td>94.1</td>
<td>16</td>
</tr>
<tr>
<td>2. Perseverance</td>
<td>82.4</td>
<td>14</td>
</tr>
<tr>
<td>3. Planning</td>
<td>70.6</td>
<td>12</td>
</tr>
<tr>
<td>4. Keeping records/notes</td>
<td>70.6</td>
<td>12</td>
</tr>
</tbody>
</table>

Goal setting.

Goal setting was the most used self-regulatory behavior by the students with ADHD. Students used goal setting strategies to help them accomplish their short and
long term goals. Students stated that they would both write their goals or also just keep mental track of them. Goal setting was an important theme for students with ADHD which helped these students stay focused and accomplish their tasks. The following student used goal setting to accomplish his goals and he evaluated his progress as the school year went on. He checked in with his goals and would reset them if necessary:

Q: What kind of goals do you have?

A: I have great goals. Definitely. So if I’m on the edge. Generally I think I’m going to do well. But as the semester comes along, I’ll see where I am and I be like, “Well, okay I think this is a realistic push. I have a B now, I think I can get a B plus.” I’m going to work really hard on this assignment and I’m going to figure out what the pieces will be for me to do that.

Another student links her grades to learning concepts, but also she has the need to earn better grades:

Q: What are your initial learning goals for the course? Is it to get the grade? Is it to master the content, make friends?

A. Inherently the learning goal is to appreciate the concepts and content. Like I like reading. I like learning. I like animalizing. I think it should be more to get the grade, because I feel like that's what I've always been lacking. I think I've gotten by on the fact that I'm decent with content and teachers like me, so that's why I get B's. But really to get A's and to keep getting B's at this point because it gets more difficult, you need to have better study skills.

**Perseverance.**

Perseverance was the second most used self-regulatory behavior by the students with ADHD. Many students encountered diverse challenges through their education journey, and through perseverance they were able to have more successful
outcomes. Students had different reasons for persevering including linking more value to a particular subject, getting high grades, or pleasing their parents. The following student persevered because he enjoyed the subject matter:

…There’s some classes where a week into it, I think “Oh, this is really interesting. I would like to learn this and I would like to really spend a lot more time learning this because I’m interested in it.”

Another student persevered despite years of not achieving his goal of finishing college. College work is challenging and he perceived that he had been struggling with schools tasks. He still persevered and motivated to complete college:

Q: Do your parents tell you, don't do what we did, finish the degree?

A: Yes. I was actually the one that told myself right at 17 out of high school, I'm going to start college. Yet, 10 years later, I'm still here. But it has been a struggle, I've had a lot of obstacles and ups and downs, but I'm still very...

Q: You persevere...

A: Yeah. I'm very motivated and very driven to be done.

*Planning.*

The third most used self-regulatory behavior used by the students with ADHD was planning. Students had different planning strategies that allowed them to become more successful in school. This would include anything from using a daily planner to mentally keeping track of goals and objectives. The following student had a calendar to keep him on track of his goals. His calendar allowed him to set specific time aside to complete tasks:

Q: Any other specific plans? Maybe in lecture and how you go about succeeding as a student?
A: I feel like I’ve always done what works and it’s always worked for me. I just do things as they come along. I know how much time things are going to take me. I know this will take me two days, so I will do it two days before it is due.

Q: Because some students are kind of just floating on a breeze?

A: I have a calendar. I have my Google Calendar and I’m always looking at the week ahead and I know what’s due in the next week, so how much my weekend is going to be homework time and how much is not. Yeah. Setting aside specific plans. I will block a free time on Thursday and I have this due Friday so that will be the time I do that. It just kind of comes together. I always a plan for that week, I have a mental picture of what I’ll be doing each day ahead of time.

Another student had specific plans for each day balancing work and fun activities:

Q: So what are your specific plans to help you succeed as a student?

A: Well, I try to make it so that. Okay. On Mondays, I go straight from school to work. And I usually do something in the morning. So by the time I get out of work at like 10:30 or 11 at night, I don't have it in me to study. So I think it's okay for me to go out and have a couple of beers Mondays and Wednesdays when I get home from work. But if I do that then it slows down my Tuesday and Thursday morning. So I have to set myself up. I have to know myself basically.

**Keeping records and notes.**

Keeping records and notes was the fourth most used self-regulatory behavior by the students with ADHD. Students had different methods of taking notes and studying for tests, but a common theme was that there was record keeping and note taking done by students. The following student outlines her note taking and record keeping strategy:
Definitely note taking. Outside of class reading textbooks. Outlining is big for me. Even if I outline… writing things down even if I don’t read over them later, just the active process of taking really detailed notes works for me.

**Students with ADHD at a two-year college level.**

For students with ADHD at a two-year college level, in the analysis of the qualitative result, only two most frequently used themes were examined due to the small sample observed: (1) keeping records and notes, and (2) goal setting. Table 4.10 presents the four major emerging themes, their percentages, and frequencies.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Percentage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Keeping records and notes</td>
<td>100</td>
<td>5</td>
</tr>
<tr>
<td>2. Goal setting</td>
<td>80</td>
<td>4</td>
</tr>
</tbody>
</table>

**Keeping records and notes.**

Keeping records and notes was the first most used self-regulatory behavior by the students with ADHD at a two-year college. Students had different strategies for keeping records and note taking. The following student elaborates on his strategy which includes reviewing:

Usually note taking. I don't usually study to be honest. I usually just take notes. I need to review the subject if I really know that I can't, then I'll review it. But just for me, I'll remember what they said. And if I took the notes, then
something clicks in my mind, just writing it down. So I don't... I just have a really good recalling, when I put things together I guess.

**Goal setting.**

The second most used self-regulatory behavior by students with ADHD was goal setting. The following student discusses her goals which did not include academic goals, but general goals:

Q: So do you set general goals?

A: Yeah. I mean like goals trying to save money and stuff like that.

Another student discusses her short-term goals of studying with flashcards for accomplishing academic tasks:

I have set goals. You know I've made a point to make sure that I use my flashcards, put the information on that. I've made time to come and do the tutoring center here and get the extra help that I need.

This student discusses his long-term goals and how it fits into his life:

I did a lot of growing up recently so I probably just maturing, seeing the benefits of long-term goals rather than just instant gratification.

**Discussion**

**Question 1**

In examining question 1 from a quantitative standpoint, the findings revealed that there was a significant mean difference in self-regulation between both groups. This result indicated that the students without ADHD presented a mean of .1931 more than those students without ADHD. In addition, in evaluating specific self-regulation strategies between the groups, the results showed that there was a close to
a significant mean difference in receiving between the groups. In the observation of
the means of all self-regulation strategies, searching behavior was found to show the
highest mean for both groups.

In examining question 1 from a qualitative standpoint, the findings revealed
five emerging themes of self-regulation strategies for the students with ADHD which
are: (1) goal setting, (2) perseverance, (3) keeping records/notes, (4) monitoring, and
(5) planning and seeking assistance/information from professors. The other identified
themes included organizing, reviewing materials, seeking assistance/information
from peers, evaluation, time management, checking goals, previewing
texts/materials, and seeking help from parents and TAs.

In reflecting on the findings from both a quantitative and qualitative
standpoint for question 1, they point out that self-regulation strategies can play a role
in helping students with ADHD. Students with ADHD are using self-regulation
strategies to help them achieve their goals. If self-regulation strategies can be used
for students with ADHD, then this can be a great solution to help this population of
students. This area will be discussed further in chapter 5.

The results of these findings help give further understanding and clarity to the
research that has already been done on self-regulation (Zimmerman, 2002; Writh &
Leutner, 2008). There are themes that are consistent with helping students become
more self-regulated in past research that is consistent with the findings in this study.
These themes include goal setting, perseverance, monitoring, and planning.
In reviewing the framework involving six dimensions of self-regulation: 1. Motive, 2. Methods, 3. Time, 4. Physical environment, 5. Social environment, and 6. Performance (Dembo et al., 2006; Schunk & Zimmerman, 1994; Zimmerman, 1994; Zimmerman & Risemberg, 1997), the findings in this study share common themes. The students in this study were self-regulated based on their motivations; they used different methods to become self-regulated; time management was a factor in their success; their physical and social environment played a role; and they had different levels of performance.

**Question 2**

In examining question 2 from a quantitative standpoint, the findings revealed that a significant difference was not found in self-regulation between the groups. There was a significant mean difference in the sub-analysis scale of assessing between the two groups of the ADHD students. The ADHD students at the four-year college level had .403 more mean than its counterparts at the two-year college level. The results of the rest of the analysis indicated that there was no significant mean difference in other subscales.

In examining question 2 from a qualitative standpoint, the findings revealed four emerging themes of self-regulation strategies for the student groups with ADHD at a two-year vs. four-year college level. These themes were: (1) goal setting, (2) perseverance, (3) planning, and (4) keeping records/notes. For students with ADHD at a two-year college level, only two most frequently used themes were examined due to the small sample observed: (1) keeping records and notes, and (2) goal setting.
In reflecting on the findings from both a quantitative and qualitative standpoint for question 2, self-regulation strategies played a role in helping students with ADHD succeed in school. Students are using diverse self-regulation strategies with and without medication to help them achieve their goals. These findings support the position that self-regulation strategies do help students with ADHD. This area will be further discussed in chapter 5.

The findings from question 2 reflect common themes found in earlier research for self-regulation (Zimmerman, 2002; Writh & Leutner, 2008). These themes include goal setting, perseverance, monitoring, and planning. This new area of finding helps give clarity and understanding to how self-regulation strategies can help students with ADHD. The findings are also consistent with the six dimensions of self-regulation which include: 1. Motive, 2. Methods, 3. Time, 4. Physical environment, 5. Social environment, and 6. Performance (Dembo et al., 2006; Schunk & Zimmerman, 1994; Zimmerman, 1994; Zimmerman & Risemberg, 1997).

**Summary**

The findings from both Question 1 and Question 2 support the position that self-regulation strategies can play a role in helping students with ADHD succeed in school. Both quantitative and qualitative methodology was used in accordance with Creswell (2009). Triangulation helped with internal and external validity and reliability (Lincoln & Gube, 1985). In terms of internal validity, the number of interview questions, probing, as well as observation helped with credibility. In terms of external validity, a diverse group of students were used at random and through
snowballing, at different colleges, to help with external validity. In terms of internal validity, accurate records were taken, full reports were written up, and there were inter-rater checks on coding. Lastly, in terms of external validity, data was gathered using interviews and observations which can be tracked back to original sources. Other researchers can reproduce the study and its results.

Triangulation helped give further credibility and support for the research findings due to strong internal and external validity and reliability. Chapter 5 will discuss what these findings mean, how they can be used in practice, and how researchers can build upon this study to give further understanding and awareness to this important area.

The findings in Questions 1 & 2 also help give clarity and understanding to the area of self-regulation. Common themes of motive, methods, time, physical environment, and social environment were found in this study which are consistent with the findings of self-regulation in earlier research. These findings support the position that there are common areas of self-regulation that can play a role in helping students with ADHD become more successful in school.
CHAPTER 5
DISCUSSION

This study examined the relationship between self-regulation strategies and attention-deficit/hyperactivity disorder (ADHD) on college students. The areas of self-regulation and ADHD have independently been studied; however, how self-regulation strategies can help college students with ADHD has not been adequately addressed. This study showed that self-regulation strategies can play an important role in helping college students with ADHD become more successful in college. This is an important finding because there has been concern about medical treatment options, and non-medical treatment options have been desired by many. This chapter discusses the findings of this study within the context of the research that has already been conducted.

ADHD & Self-Regulation

This study has expanded upon the area of research of self-regulation and ADHD. Research began with first understanding what ADHD was and how it could be treated. It was found that ADHD is a serious neurobehavioral development disorder that causes many problems in individuals including problems in attention span, impulse control and activity level (Barkley, 2000; American Psychiatric Association, 2000). These impairments can have a serious impact on one’s life. The research in this area has been exhaustive to find solutions for individuals with ADHD with findings that support the position that medical treatments can be an effective way to treat individuals with ADHD (Barkley, 2000; Bernstein, 2007).
Researchers then found self-regulation to be an important area because it deals with how individuals activate and sustain behaviors, cognitions, affects (Schunk, Pintrich, & Meece, 2008). This area of research has received more attention in the past few years because of important findings in helping individuals become more successful. Areas of research in self-regulation include goal-setting, monitoring, persevering, and evaluating. These areas are linked to self-regulatory skills and shape an individual’s ability to motivate and sustain desired behaviors.

The combined area of research of ADHD and self-regulation is a newer area of study. It has received more attention in the last decade with important findings (Kaplan & Berman, 2010; Kerns, Eso, & Thomson, 2010; Reid, Trout, & Schwartz, 2005). Areas of particular research include self-monitoring and self-management which have produced meaningful improvements in students for academic productivity, on-task behavior, and reduction of inappropriate behaviors (Reid, Trout and Schwartz, 2005). Findings support the position that self-regulation strategies can play a role in treating students with ADHD.

This study has now built upon this area of research being that it is a newer area of research. The particular focus was on college students at different college settings. Mixed methodology was used. The quantitative research used the Self- Regulation Questionnaire (SRQ) to establish a foundational understanding of students’ self-regulation strategies. Supplemental interviews helped provide a further depth of understanding on students’ experiences using self-regulations strategies.
The study found that self-regulation can be an important treatment option for college students with ADHD just as Reid, Trout, and Schwartz (2005) found in their research. This is an important finding because it expands the research in this area and reveals new non-medical treatment options for students with ADHD.

The findings in this study are consistent with the findings of previous research on self-regulation. It supports the themes found which include goal setting, perseverance, monitoring, and planning (Zimmerman, 2002; Wirth & Leutner, 2008). These are important areas of self-regulation that students in this study use to help them become more successful students. The findings in this study also support the framework of six dimensions of self-regulation (Dembo et al., 2006; Schunk & Zimmerman, 1994; Zimmerman, 1994; Zimmerman & Risemberg, 1997). These dimensions include: 1. Motive, 2. Methods, 3. Time, 4. Physical environment, 5. Social environment, and 6. Performance. Students use self-regulation strategies that are congruent with the six dimensions which supports the position that self-regulation strategies play an important role in helping students become more successful in school. The implications for practice are significant which will be discussed in the next section.

**Implications for Practice**

There are a number of implications for practice as a result of this study. Teachers, counselors, administrators, and others can implement self-regulation strategies for their students with ADHD in diverse ways to help them become more successful in college. First, disability centers should become further educated on how
self-regulation strategies can help students with ADHD. They should understand the importance of different areas of self-regulation, including goal-setting, perseverance, monitoring, and other areas so that they can properly educate ADHD students on self-regulation strategies. The goal is to have disability centers use self-regulation strategies with their ADHD students with and without medication. With the milder cases of students with ADHD, students can even use self-regulation strategies without medication. Educating staff and administration at disability centers who treat students with ADHD on new self-regulation strategies can be an effective way to introduce new treatment options for students with ADHD.

Second, school administrators should be further educated on areas of self-regulation and how this area can help students with ADHD. In orientation and continuing education courses for faculty and staff, self-regulation should be discussed and reviewed so that faculty can incorporate self-regulation methods into their curriculums and other areas. Instructors should teach self-regulation strategies along with their curriculums. Also, if staff is educated on the importance of self-regulation strategies, they can better assist students with ADHD in more effective ways.

Third, the college tutoring center as well as the library can also be a place where staff and tutors can be educated on self-regulation strategies. These places offer workshops, seminars, and other resources that can be helpful for students with ADHD. These places can supplement other locations on campus where self-regulation strategies should be taught and encouraged.
Lastly, educational material on self-regulation strategies should be distributed to diverse locations throughout the country. These locations should include psychologist offices, education centers, tutoring locations, various school environments, non-profits, and other educational areas. The more information that is out there about self-regulation strategies that can help students with ADHD, the better off students with ADHD will be. It is important that self-regulation information is up-to-date, promoted and encouraged on a regular basis in diverse ways.

The implications for practice for this area of study are numerous. Because the results of this study are encouraging for self-regulation strategies for students with ADHD, this area should be given much attention. There are many areas where educational professionals should be educated of self-regulation strategies for treating students with ADHD.

**Limitations**

There are a number of limitations to this study. First, the sample population used was small. There were 48 students used, 16 for each of three different college settings; eight students with ADHD and eight students without ADHD. Due to the small sample size, students in this study may not be representative of the general body or other college students. From a quantitative standpoint, a larger group of student should be used in future studies.

Second, there were only three colleges selected, all in southern California. The study could reveal more insights if the number of colleges and locations was
expanded to include different areas throughout the United States and internationally. Also, limited college settings were used which included settings at a two-year college, four-year public college, and four-year private college level. Future studies can include more colleges with diverse settings.

Third, a limited number of questions were asked giving students the opportunity to answer in an open-ended format. Future research should expand the number of questions and dig deeper into probing so that more insights can be revealed. More questions along with additional probing would give further validity and credibility to the study along with stronger triangulation.

Lastly, all biographical and quantitative data collected for this study were self-reported. Responses may not reflect actual GPA, ethnic breakdown, or year in school. In addition, qualitative data, being also self-reported, may not be accurate. Information was gathered to the best of the researcher’s knowledge and ability. Future research can use additional steps to increase reliability of answers given by participants.

**Suggestions for Future Research**

The combined area of self-regulation and ADHD is an important area of research and should be further explored. Each area has been studied in depth, however, the combined area of self-regulation and ADHD has not been given a lot of attention. This study has provided important findings in that self-regulation strategies can play a role in treating students diagnosed with ADHD.
Future research can focus on a few areas. First, research can build upon this study by going into more depth in exploring how self-regulation strategies can impact students with ADHD. The college population can be further explored focusing on more colleges and expanding the geography. The focus can be on both contrasting different college environments and highlighting specific college environments to determine the relationship between self-regulation strategies and ADHD on students.

Second, the student population can be increased to give further validity and reliability to the study. From a quantitative standpoint, 48 participants is a small number so this sample population can be increased much more. The sample population should also be increased in its geographic area and college environment.

Third, different areas of self-regulation can be studied. To get further clarity on self-regulation on college students with ADHD, specific areas of self-regulation can be studied. Also, more in depth analysis and research can be done on the general themes. By studying this area more, researchers can gain further understanding and awareness on how self-regulation strategies can be used to treat students with ADHD.

Fourth, different education levels, age groups, ethnicities and gender can be studied. By studying these different variables, researchers can get a better understanding on how different areas can play a role in self-regulation strategies on students.
Fifth, students with different levels of ADHD can be studied in relation to self-regulation strategies. This type of research can be an important step in determining the role of self-regulation strategies on ranges of ADHD. The goal is to get clarity on the role self-regulation strategies can have on a range of cases involving different levels of students with ADHD.

Lastly, a survey instrument can be used to gain further understanding on students with ADHD and how self-regulation strategies can help them. The SRQ can be used or a new model can be formulated to more directly address this area of research. By having a survey instrument used, counselors, teachers, researchers can get a better understanding of the area of self-regulation strategies on students with ADHD.

**Conclusion**

This study provides an exploratory study of self-regulation strategies that can be used for students with ADHD at both the four-year and two-year college level. Self-regulation strategies appear to play a role in helping students with ADHD succeed in college at both the four-year and two-year college level. Working towards self-regulation treatment options for college students with ADHD may be effective and should be further explored.

Other areas need to be further studied to get more clarity on this important area of research. These areas include diverse college setting, expanding the sample population, evaluating self-regulation strategies in relation to different levels of
ADHD, and further researching areas such as GPA, ethnicity, gender, and year in school.

This research area is important to society because it gives students treatment options other than medication. This area of research helps to open up new areas of understanding, meaning, and solutions for students with ADHD. The implications are strong given that many students are diagnosed with ADHD and they are looking for treatment options. When students have more treatment options and there are new solutions available, students will be able to have succeed at a higher level in school, thus leading to a positive impact on them, the school environment, and society.

In summary, this study showed that self-regulation strategies can play an important role in treating college students with ADHD. Further research is required to get more clarity and understanding on how self-regulation strategies can be helpful in treating students with ADHD. This area of research is still in its early stages. With addressing this area in future studies, important findings can be made in treating college students with ADHD. These finding can take the place and also supplement medical treatment options.
REFERENCES


APPENDIX A

University Park Institutional Review Board Form

UNIVERSITY OF SOUTHERN CALIFORNIA
UNIVERSITY PARK INSTITUTIONAL REVIEW BOARD
FWA 00007099

Exempt Review

Date: Nov 23, 2011, 09:35am
Principal Investigator: Jeffrey Haig
Faculty Advisor: Patricia Tobey
Co-Investigators:
Project Title: ADD and Self Regulation
USC UPIRB # UP-11-00436

The iStar application and attachments were reviewed by UPIRB staff on 11/23/2011. The project was APPROVED.

Based on the information provided for review, this study meets the requirements outlined in 45 CFR 46.101(b)(2) and qualifies for exemption from IRB review. The study is not subject to further IRB review. IRB exemption of this study was granted on 11/23/2011.

The following documents were reviewed and approved

Certified Information Sheet, dated 11-23-2011
Certified Recruitment Script, dated 11-23-2011

Minor revisions were made to the application, interview protocol, recruitment and consent documents by the IRB Administrator (IRBA). The IRBA revised documents have been uploaded into the relevant iStar sections. Please use the IRBA revised documents if an amendment is submitted and future revisions are required.

To access IRB-approved documents, click on the “Approved Documents” link in the study workspace. These are also available under the “Documents” tab.

Researchers are reminded that some site/schools require permission to conduct research even if the research is exempt from IRB review.
Sincerely,

RoseAnn Fleming, CIP

**Funding Source(s):** N/A - no funding source listed
APPENDIX B

RECRUITMENT LETTER

Dear [Name],

My name is Jeff Haig, and I am a doctoral candidate in the Rossier School of Education at University of Southern California. I am conducting a research study as part of my dissertation, focusing on self-regulation strategies. You are invited to participate in the study. If you agree, you are invited to participate in an online survey and an interview. The survey is anticipated to take no more than 30 minutes to complete, the focus group interview is anticipated to last approximately 1 hour and may be audio-taped. A $25 gift card will be given to you for your participation.

Participation in this study is voluntary. Your identity as a participant will remain confidential at all times during and after the study. Your relationship with will not be affected whether or not you participate in this study.

If you have questions or would like to participate, please contact me at

Thank you for your participation,

Jeff Haig
University of Southern California
Research Participants Needed

$25 Amazon Gift Card for 1 hour of Time

Study: USC doctoral student conducting research on motivation strategies that impact college students’ success.

Qualifications: Two types of undergraduate students needed: 1. Students diagnosed with ADHD, and 2. Students not diagnosed with ADHD.

Commitment: 45 minutes – 1 hour of time needed for an on-campus interview. The interview will consist of: 1. Completing a brief survey and 2. Answering questions on motivation strategies. It’s simple and straightforward.

Payment for Participation: a $25 gift card from Amazon will be given to you for your participation.

Contact: Please contact Jeff Haig @ haig@usc.edu if you are interested. Thank you!
APPENDIX D

Information/Facts Sheet for Non-Medical Research

University of Southern California
Rossier School of Education
3470 Trousdale Parkway
Los Angeles, CA 90089

THE ROLE OF SELF-REGULATION STRATEGIES ON 4-COLLEGE STUDENTS WITH ADHD

PURPOSE OF THE STUDY

The purpose of this study is to examine the effectiveness of self-regulation strategies for college students with ADHD. Thus, this study seeks further expand upon on how self-regulation strategies can help college students who have ADHD perform better. The goal is to understand the experiences of college students with ADHD and their experience using self-regulation strategies.

Your participation is voluntary. Your relationship with your school will not be affected whether or not you participate in this study. You must be aged 18 or older to participate.

PARTICIPANT INVOLVEMENT

If you agree to participate, you will be asked to complete an online survey and participate in an interview. The survey is anticipated to take no more than 30 minutes to complete, the interview is anticipated to last approximately 1 hour and may be audio-taped. You may decline to be recorded and continue with your participation.

PAYMENT/COMPENSATION FOR PARTICIPATION

You will receive a $25 gift card from Amazon at the end of the interview. You do not have to answer all of the questions in order to receive the card.

CONFIDENTIALITY

Any identifiable information obtained in connection with this study will remain confidential and will be disclosed only with your permission or as required by law.
The data will be stored on a password protected computer at the researcher’s residence and destroyed three years after the study has been completed. Pseudonyms (false name) will be used.

The members of the research team and the University of Southern California’s Human Subjects Protection Program (HSPP) may access the data. The HSPP reviews and monitors research studies to protect the rights and welfare of research subjects.

When the results of the research are published or discussed in conferences, no identifiable information will be used.

**INVESTIGATOR CONTACT INFORMATION**

**Principal Investigator:** Jeff Haig  
949-306-7878  
*haig@usc.edu*

**Faculty Advisor:** Dr. Patricia Tobey  
Email: *tobey@usc.edu*

**IRB CONTACT INFORMATION**

University Park IRB, Office of the Vice Provost for Research Advancement, Stonier Hall, Room 224a, Los Angeles, CA 90089-1146, (213) 821-5272 or upirb@usc.edu
APPENDIX E

Participant Background Information

The following two tables depict college level, year in college, gender, ethnicity and college GAP of the participants.

<table>
<thead>
<tr>
<th>ADHD Students</th>
<th>Four or two year college level</th>
<th>Year in College</th>
<th>Sex</th>
<th>Ethnicity</th>
<th>College GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>4 PRI</td>
<td>Senior</td>
<td>F</td>
<td>Caucasian</td>
<td>3.6</td>
</tr>
<tr>
<td>Participant 2</td>
<td>4 PRI</td>
<td>Junior</td>
<td>M</td>
<td>Caucasian</td>
<td>2</td>
</tr>
<tr>
<td>Participant 3</td>
<td>4 PRI</td>
<td>Junior</td>
<td>M</td>
<td>Hispanic</td>
<td>3.9</td>
</tr>
<tr>
<td>Participant 4</td>
<td>4 PRI</td>
<td>Senior</td>
<td>F</td>
<td>Caucasian</td>
<td>3.4</td>
</tr>
<tr>
<td>Participant 5</td>
<td>4 PRI</td>
<td>Senior</td>
<td>F</td>
<td>Caucasian</td>
<td>3.8</td>
</tr>
<tr>
<td>Participant 6</td>
<td>4 PRI</td>
<td>Junior</td>
<td>F</td>
<td>Hispanic</td>
<td>3.5</td>
</tr>
<tr>
<td>Participant 7</td>
<td>4 PRI</td>
<td>Sophomore</td>
<td>F</td>
<td>Caucasian</td>
<td>3.8</td>
</tr>
<tr>
<td>Participant 8</td>
<td>4 PRI</td>
<td>Junior</td>
<td>M</td>
<td>Caucasian</td>
<td>3.5</td>
</tr>
<tr>
<td>Participant 9</td>
<td>4 PUB</td>
<td>Senior</td>
<td>F</td>
<td>Hispanic</td>
<td>2.4</td>
</tr>
<tr>
<td>Participant 10</td>
<td>4 PUB</td>
<td>Sophomore</td>
<td>F</td>
<td>Indian</td>
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</tr>
<tr>
<td>Participant 11</td>
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<td>Senior</td>
<td>F</td>
<td>Caucasian</td>
<td>2.7</td>
</tr>
<tr>
<td>Participant 12</td>
<td>4 PUB</td>
<td>Senior</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 13</td>
<td>4 PUB</td>
<td>Senior</td>
<td>F</td>
<td>Asian</td>
<td>3.5</td>
</tr>
<tr>
<td>Participant 14</td>
<td>4 PUB</td>
<td>Junior</td>
<td>F</td>
<td>Hispanic</td>
<td>3.1</td>
</tr>
<tr>
<td>Participant 15</td>
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<td>Senior</td>
<td>F</td>
<td>Caucasian</td>
<td>3.1</td>
</tr>
<tr>
<td>Participant 16</td>
<td>4 PUB</td>
<td>Senior</td>
<td>M</td>
<td>Caucasian</td>
<td>2.5</td>
</tr>
<tr>
<td>Participant 17</td>
<td>2 CC</td>
<td>Freshman</td>
<td>F</td>
<td>Hispanic</td>
<td>2.5</td>
</tr>
<tr>
<td>Participant 18</td>
<td>2 CC</td>
<td>Freshman</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 19</td>
<td>2 CC</td>
<td>3rd Year</td>
<td>M</td>
<td>Caucasian</td>
<td>1.5</td>
</tr>
<tr>
<td>Participant 20</td>
<td>2 CC</td>
<td>Freshman</td>
<td>F</td>
<td>Hispanic</td>
<td>3.1</td>
</tr>
<tr>
<td>Participant 21</td>
<td>2 CC</td>
<td>4th Year</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 22</td>
<td>2 CC</td>
<td>Freshman</td>
<td>M</td>
<td>Caucasian</td>
<td>Dropped Out 1st Semester</td>
</tr>
<tr>
<td>Participant 23</td>
<td>2 CC</td>
<td>Sophomore</td>
<td>F</td>
<td>African American</td>
<td>3.8</td>
</tr>
<tr>
<td>Participant 24</td>
<td>2 CC</td>
<td>Freshman</td>
<td>F</td>
<td>Middle Eastern</td>
<td>2.8</td>
</tr>
</tbody>
</table>

*Note.* Four or two year college level (PRI =Private, PUB = Public College, CC = Community College); Sex (F = Female, M = Male)
APPENDIX F

THE SELF-REGULATION QUESTIONNAIRE (SRQ)

Please answer the questions below from 1-5.

**1 Strongly disagree**
**2 Disagree**
**3 Uncertain or Unsure**
**4 Agree**
**5 Strongly Agree**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer (1-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I usually keep track of my progress toward my goals.</td>
<td></td>
</tr>
<tr>
<td>2. My behavior is not that different from other people.</td>
<td></td>
</tr>
<tr>
<td>3. Others tell me that I keep on with things too long.</td>
<td></td>
</tr>
<tr>
<td>4. I doubt I could change even if I wanted to.</td>
<td></td>
</tr>
<tr>
<td>5. I have trouble making up my mind about things.</td>
<td></td>
</tr>
<tr>
<td>6. I get easily distracted from my plans.</td>
<td></td>
</tr>
<tr>
<td>7. I reward myself for progress toward my goals.</td>
<td></td>
</tr>
<tr>
<td>8. I don't notice the effects of my actions until it's too late.</td>
<td></td>
</tr>
<tr>
<td>9. My behavior is similar to that of my friends.</td>
<td></td>
</tr>
<tr>
<td>10. It's hard for me to see anything helpful about changing my ways.</td>
<td></td>
</tr>
<tr>
<td>11. I am able to accomplish goals I set for myself.</td>
<td></td>
</tr>
<tr>
<td>12. I put off making decisions.</td>
<td></td>
</tr>
<tr>
<td>13. I have so many plans that it's hard for me to focus on any one of them.</td>
<td></td>
</tr>
<tr>
<td>14. I change the way I do things when I see a problem with how things are going.</td>
<td></td>
</tr>
<tr>
<td>15. It's hard for me to notice when I've “had enough” (alcohol, food, sweets).</td>
<td></td>
</tr>
<tr>
<td>16. I think a lot about what other people think of me.</td>
<td></td>
</tr>
<tr>
<td>17. I am willing to consider other ways of doing things.</td>
<td></td>
</tr>
<tr>
<td>18. If I wanted to change, I am confident that I could do it.</td>
<td></td>
</tr>
<tr>
<td>19. When it comes to deciding about a change, I feel overwhelmed by the choices.</td>
<td></td>
</tr>
<tr>
<td>20. I have trouble following through with things once I've made up my mind to do something.</td>
<td></td>
</tr>
<tr>
<td>21. I don't seem to learn from my mistakes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>22.</td>
<td>I'm usually careful not to overdo it when working, eating, drinking.</td>
</tr>
<tr>
<td>23.</td>
<td>I tend to compare myself with other people.</td>
</tr>
<tr>
<td>24.</td>
<td>I enjoy a routine, and like things to stay the same.</td>
</tr>
<tr>
<td>25.</td>
<td>I have sought out advice or information about changing.</td>
</tr>
<tr>
<td>26.</td>
<td>I can come up with lots of ways to change, but it's hard for me to decide which one to use.</td>
</tr>
<tr>
<td>27.</td>
<td>I can stick to a plan that's working well.</td>
</tr>
<tr>
<td>28.</td>
<td>I usually only have to make a mistake one time in order to learn from it.</td>
</tr>
<tr>
<td>29.</td>
<td>I don't learn well from punishment.</td>
</tr>
<tr>
<td>30.</td>
<td>I have personal standards, and try to live up to them.</td>
</tr>
<tr>
<td>31.</td>
<td>I am set in my ways.</td>
</tr>
<tr>
<td>32.</td>
<td>As soon as I see a problem or challenge, I start looking for possible solutions.</td>
</tr>
<tr>
<td>33.</td>
<td>I have a hard time setting goals for myself.</td>
</tr>
<tr>
<td>34.</td>
<td>I have a lot of willpower.</td>
</tr>
<tr>
<td>35.</td>
<td>When I'm trying to change something, I pay a lot of attention to how I'm doing.</td>
</tr>
<tr>
<td>36.</td>
<td>I usually judge what I'm doing by the consequences of my actions.</td>
</tr>
<tr>
<td>37.</td>
<td>I don't care if I'm different from most people.</td>
</tr>
<tr>
<td>38.</td>
<td>As soon as I see things aren't going right I want to do something about it.</td>
</tr>
<tr>
<td>39.</td>
<td>There is usually more than one way to accomplish something.</td>
</tr>
<tr>
<td>40.</td>
<td>I have trouble making plans to help me reach my goals.</td>
</tr>
<tr>
<td>41.</td>
<td>I am able to resist temptation.</td>
</tr>
<tr>
<td>42.</td>
<td>I set goals for myself and keep track of my progress.</td>
</tr>
<tr>
<td>43.</td>
<td>Most of the time I don't pay attention to what I'm doing.</td>
</tr>
<tr>
<td>44.</td>
<td>I try to be like people around me.</td>
</tr>
<tr>
<td>45.</td>
<td>I tend to keep doing the same thing, even when it doesn't work.</td>
</tr>
<tr>
<td>46.</td>
<td>I can usually find several different possibilities when I want to change something.</td>
</tr>
<tr>
<td>47.</td>
<td>Once I have a goal, I can usually plan how to reach it.</td>
</tr>
<tr>
<td>48.</td>
<td>I have rules that I stick by no matter what.</td>
</tr>
<tr>
<td>49.</td>
<td>If I make a resolution to change something, I pay a lot of attention to how I'm doing.</td>
</tr>
<tr>
<td>50.</td>
<td>Often I don't notice what I'm doing until someone calls it to my attention.</td>
</tr>
<tr>
<td>51.</td>
<td>I think a lot about how I'm doing.</td>
</tr>
<tr>
<td>52.</td>
<td>Usually I see the need to change before others do.</td>
</tr>
<tr>
<td>53.</td>
<td>I'm good at finding different ways to get what I want.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>54.</td>
<td>I usually think before I act.</td>
</tr>
<tr>
<td>55.</td>
<td>Little problems or distractions throw me off course.</td>
</tr>
<tr>
<td>56.</td>
<td>I feel bad when I don't meet my goals.</td>
</tr>
<tr>
<td>57.</td>
<td>I learn from my mistakes.</td>
</tr>
<tr>
<td>58.</td>
<td>I know how I want to be.</td>
</tr>
<tr>
<td>59.</td>
<td>It bothers me when things aren't the way I want them.</td>
</tr>
<tr>
<td>60.</td>
<td>I call in others for help when I need it.</td>
</tr>
<tr>
<td>61.</td>
<td>Before making a decision, I consider what is likely to happen if I do one thing or another.</td>
</tr>
<tr>
<td>62.</td>
<td>I give up quickly.</td>
</tr>
<tr>
<td>63.</td>
<td>I usually decide to change and hope for the best.</td>
</tr>
</tbody>
</table>

The Self-Regulation Questionnaire (Brown, Miller, & Lawendowki, 1999) was developed to assess self-regulatory processes through self-report and is in the public domain and may be freely used, adapted, reproduced without special permission.
APPENDIX G

INTERVIEW PROTOCOL FORM

Student Interview Protocol

Institution: _____________________________________________________

Interviewee (Title and Name): ______________________________________

Interviewer: _____________________________________________________

Survey Section Used:

_____ A: Interview Background

_____ B: Interview Questions

_____ C: Post-Interviewer Comments and/or Observations

Other Topics Discussed:

_______________________________________________________________

_______________________________________________________________

Documents Obtained: ____________________________________________

_______________________________________________________________

Assessment Interviews

Introductory Protocol

To facilitate our note-taking, we would like to audio tape our conversations today. Your participation is voluntary and you may stop at any time if you feel uncomfortable. Thank you for your agreeing to participate.

We have planned this interview to last no longer than one hour. During this time, we have several questions that we would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning.
Introduction

You have been selected to speak with us today because you have been identified as someone who has a great deal to share about your experience with ADHD. Our research study as a whole focuses on getting an in depth understanding of your experience as a student with a documented disability of ADHD, with particular interest in understanding how students with disabilities are engaged succeeding in college. This study aims to learn more about your academic experience and hopefully help researchers learn about practices that can help improve student learning.

A. Interviewee Background

Age, sex, ethnicity, and college GPA:

Interesting background information on interviewee:

What is your highest degree? _________________________________________________

What is your field of study? _______________________________________________
6. Are you a student who perseveres until you succeed or do you give up easily?  
   Probe: Can you give examples of circumstances or situations when you persevered and when you gave up?

7. How would you describe your experience with learning student success strategies?  
   Probe: Can you elaborate specific strategies you use to help you succeed as a student?

8. What has your instructor done to address your learning needs as a student with a documented disability?  
   Probe: Can you give me an example of what was helpful about it?

9. How do you believe you will perform in your courses?

10. What were your expectations for the course? (Specifically with regard to your own beliefs about your ability to successfully complete the course).

11. What were your initial learning goals for your course(s)?  
   Probe: How has this changed after taking the course(s)?

12. Describe examples of important learning events during the course that may have influenced your level of motivation and performance.

13. What did you expect your final grade for the class to be?  
   Probe: Describe whether you were able to meet your own expectations for the course or your experiences in being able to meet your expectations.

14. How would your needs in the course be better supported?  
   Probe: How could your Professor/Instructor have better met your learning needs?

C. Post Interview Comments and/or Observations: