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Assessment of Pre-service Physical Education Teacher Education (PETE) Students Self-Regulation: Implications for Teacher Foundational Enhancement

Terry Olson

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Terry Dale Olson

Candidate

Health, Exercise, and Sports Sciences

Department

This dissertation is approved, and it is acceptable in quality and form for publication:

Approved by the Dissertation Committee:

Glenn Kupper Olson _____, Chairperson

John C. Ban _____

Jenni Flaweday _____

Virginia Wilmerdy _____

**ASSESSMENT OF PRESERVICE PHYSICAL EDUCATION TEACHER
EDUCATION (PETE) STUDENTS' SELF-REGULATION:
IMPLICATIONS FOR TEACHER FOUNDATIONAL ENHANCEMENT**

BY

TERRY D. OLSON

B.S., Physical Education, New Mexico State University, 2000
M.S., Curriculum and Instruction, University of New Mexico, 2005

Dissertation
Submitted in Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy
Physical Education, Sports, and Exercise Science

The University of New Mexico
Albuquerque, New Mexico

December, 2009

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DEDICATION

I want to dedicate the accomplishment of this degree to my supportive wife Michele. It was with great sacrifice and selflessness on her behalf which has given me the opportunity to fulfill a dream. This accomplishment is as much hers as it is mine. To her I will be forever grateful!

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Finally, I would like to thank my two children Tyler and Macey for their unconditional love. To them I wish a lifetime of learning and happiness. Remember to always follow your dreams, live with a good heart, and trust in God for all your support.

Your Daddy loves you!

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ABSTRACT

The purpose of this quantitative dissertation was to examine factors determining self-regulation of pre-service physical education teacher education (PETE) students. There is a gap in the literature on self-regulatory capabilities of pre-service teachers and how they self-regulate their learning. Self-regulation theory, the foundation of this study, holds that the better one is at self-regulation, the better one is able to attain his or her goals. This research examined whether a relationship exists between pre-service physical education teachers' self-regulation, goal-setting, strategy implementation, and strategy monitoring as a function of gender, year in program, current GPA, anticipated GPA upon graduation, and weekly study time. The relationship between variables was examined by implementing descriptive statistics and factorial ANOVA's. Pre-service physical education students at a major university in the southwest ($n=141$) were given the Five-Component Scale of Self-Regulation (FCSSR) (Maclellan & Soden, 2006) to measure self-regulation as based on the social cognitive theory. Results showed there was a significant relationship between pre-service physical education teachers overall self-regulation and how much they studied through their academic week. Gender, year in

program, current GPA, and anticipated GPA upon graduation were not factors as measured against self-regulation and its subcomponents (goal-setting, strategy monitoring, and strategy implementation). These findings indicate self-regulating pre-service teachers utilize an optimal amount of study time throughout a given week. Additional findings showed there was statistical significance in the interactions between the participant's year in program and GPA in that the lower the GPA, the higher the self-regulatory skills are. This indicates there is a plateau effect as students mature in their self-regulatory abilities while in their PETE program.

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CHAPTER 1

Introduction

Research has been devoted to pre-service teachers in physical education teacher education (PETE) programs with the aim to improve the quality of instruction of future physical educators (Ayers & Griffin, 2005; Cole & Knowles, 1993; Hodge, Tannehill, & Kluge, 2003; Kirk & Macdonald, 2001). This past research has been conducted over many years across a broad span of topics. One of those studied areas is the concept of self-regulation. Self-regulation, as based on social cognitive perspective, is considered a multifaceted system that involves the interaction between behavior, self, and environment (Bandura, 1986).

According to Cleary and Zimmerman (2004), self-regulated learners are said to be proactive learners who routinely incorporate various self-regulation sub processes (e.g., goal setting, self-observation, self-evaluation) with task strategies (e.g., study, time-management, and organizational strategies) and self-motivational beliefs (e.g., self-efficacy, intrinsic interest). In addition, it is assumed that these types of learners covertly regulate their academic behaviors and beliefs in three cyclical phases: forethought (i.e., processes that precede any effort to act), performance/volition control (i.e., processes occurring during learning efforts), and self-reflection (i.e., processes occurring after learning or performance). Thus, it is believed that those who have better ability to attain personal goals through the use of forethought, volition control, and reflection are, in fact, more self-regulated individuals.

To ensure success of pre-service teachers involved in a Physical Education Teacher Education (PETE) program, self-regulation skills are considered a key

component in enhancing their ability to increase academic success and understanding of the multifaceted nature of physical education (e.g. motor learning, biomechanics, pedagogy, etc.) as a discipline. Upon completion of a PETE program, pre-service teachers have been placed in a physical education classroom where decisions on a regular basis must be made in the fast pace environment of students involved in physical activities. Although these individuals have had residency experience as student teachers, the student teaching experience may not have been of sufficient duration to understand the multitude of “situational experiences” they encounter.

It often takes continuous hands-on experience to become an effective physical educator who is equipped with skill sets to produce necessary reflections about-action (forethought), in-action (volition control), and on-action (self-reflection). While students are engaged in the physical education classroom, in-service teachers must mentally multitask in areas like instructional modification, child safety, questions from students, etc. Thus, the teacher’s ability, or inability, to self-regulate multiple situations could drastically impact the decisions being made and thus the quality of the output. Their ability to self-regulate could ultimately decide whether modified instruction is clarified accurately in a timely manner or potentially whether children are injured as a result of an activity.

Fortunately, the covert loop (forethought, volition control, and self-reflection) of self-regulation could be infused into the regular daily curriculum of the PETE program. College classes enforcing methodology of teaching could implement the self-regulation process while the pre-service teachers are engaged in peer lessons. This infusion of self-regulation could initially be accomplished at the beginning of the course when the

instructor dissects the phase structure and sub-processes of the covert loop. Within the initial skill lesson, the instructor may discuss how self-regulation is utilized through the use of clear examples and demonstration of its functioning. Subsequently, students will list their own thoughts and reflections under the same substructures of forethought (task analysis and self-motivational beliefs), volition control (self-control, and self-observation) and self-reflection (self-judgment and self reaction) as they occur to share with the class upon completion of the lesson.

For an example, if a motor skill was being taught in a methods class, the pre-service teacher could verbally dictate via his or her own lesson plan the three phases involved in the writing process. The pre-service teacher could first discuss the *forethought* process of the skill by talking about how he/she set the goals for the students, what type of strategic planning they used, outcome expectation of the lesson, and his or her own personal self-efficacy of the skill and how it changed the instructional process. Pre-service teachers could also discuss their own *volition control* by identifying what they focused their attention on while the lesson was occurring, or even by how they self-instructed themselves as the lesson occurred. Finally, pre-service teachers could discuss their own *self-reflection* of the lesson by talking about possible causal attributions and overall satisfaction of the lesson as a whole.

As a result, practice teaching and opportunities for pre-service teachers' to learn and practice self-regulation skills during their academic career may be beneficial in enhancing their overall success upon graduation to a teaching role. Thus, PETE students must learn to adjust to these immediate ongoing demands as they enter the field. They need to adapt to the environment as it changes from one day to the next. More than ever,

physical education teachers need to be trained to utilize their cognitive abilities and be able to regulate what is occurring in front of them with increased spontaneity.

Statement of the Problem

Many issues surround future physical education teachers as they complete their PETE program and become in-service educators. One of these issues is the under-developed cognitive and self-regulatory ability of teachers resulting in decreased quality of physical educators' abilities to effectively educate students they serve. Often, new teachers are not equipped with the necessary cognitive skills to reflect in-action, on-action, and about-action as it pertains to their classroom. They do not always have the necessary appropriate reflective practices to summate what is occurring or has occurred to the students. Consequently, pre-service teachers may not be able to accurately reflect as to how to change a lesson that has gone awry. To prepare pre-service teachers for such situations, more instructional integration is necessary to assist them to engage cognitively before they transition into in-service roles. Thus, research of pre-service teachers' self-regulation is an appropriate means to analyze their cognitive abilities. Analyses of pre-service teachers' self-regulatory processes will give better insight as to how they utilize self-regulation on their own and what practice they may need during the development phase of their academic career.

Purpose of the Study

The purpose of the study was to assess self-regulatory learning of pre-service physical education teachers in a PETE program. Emphasis was placed on self-regulation's foundational components of forethought (task analysis, self-motivating beliefs), volition control (self-control, self-observation), and self-reflection (self-

judgment, and self reaction) as it related to pre-service teachers self-regulatory abilities as assessed by a modified version of the Five-Component Scale of Self-Regulation (FCSSR) (Maclellan & Soden, 2006).

Significance of the Study

The significance of assessing pre-service physical education teachers' self-regulation as it pertains to their teaching ability was to identify key cognitive strategies that assist in the students' ability to overcome difficult situations while in a PETE program. The results of this study may assist in the integration of interventions to all PETE programs which emphasize pre-service teachers' ability to self-regulate their actions to attain their goals.

Research Hypotheses

As a result of a gap in research literature, this study investigated the following research hypotheses with regards to pre-service physical education teachers' self-regulation:

Research Hypothesis 1.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in overall Self-Regulation as a function of year in program.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in overall Self-Regulation as a function of year in program.

Research Hypothesis 2.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in goal-setting as a function of year in program.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in goal-setting as a function of year in program.

Research Hypothesis 3.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in strategy-implementation as a function of year in program.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in strategy-implementation as a function of year in program.

Research Hypothesis 4.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in strategy monitoring as a function of year in program.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in strategy monitoring as a function of year in program.

Research Hypothesis 5.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in Self-Regulation as a function of gender.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of gender.

Research Hypothesis 6.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in Self-Regulation as a function of grade point average (GPA).

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of grade point average (GPA).

Research Hypothesis 7.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in Self-Regulation as a function of anticipated grade point average (GPA) upon graduation.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of anticipated grade point average (GPA) upon graduation.

Research Hypothesis 8.

H_0 : Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in Self-Regulation as a function of weekly study time for classes.

H_a : Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of weekly study time for classes.

Delimitations

The following delimitations of this study:

1. Participants ($n=141$) were pre-service K-12 physical education teachers enrolled in a PETE program with the expectations of teaching upon graduation.
2. The modified version of the Five-Component Scale of Self-Regulation (FCSSR) was used to collect the data.
3. Data were collected once during the semester.
4. Voluntary participants were chosen by convenience sampling from K-12 PETE program at a state university in the southwest. .

Limitations

The following were limitations of this study:

1. This study's generalizability is limited to pre-service physical education teachers enrolled in similar PETE programs.
2. The participants of pre-service teachers selected in the proposed study were from a convenience sample.

Assumptions

The following assumptions were made for the proposed study:

1. The subjects of the study responded honestly and accurately to the questionnaire.
2. The questionnaire was psychometrically valid in measuring the variables in the study.
3. The questions within the questionnaire were understood by the pre-service teachers.
4. The answers given reflected the reality of practice.

Definition of Terms

The following definitions were used in the proposed study:

Anticipated GPA: Grade point average (GPA) anticipated by the pre-service teachers' upon graduation from the PETE program.

Goal-Setting: One of three subcategories of self-regulation as assessed by the Five-Component Scale of Self-Regulation (FCSSR). Goal-setting scores are derived from the addition of the 15 questions within that category.

GPA: Current grade point average (GPA) of the pre-service teachers.

Overall Self-Regulation: Total added scores of the three subcomponents (goal-setting, strategy implementation, & strategy monitoring) of the Five-Component Scale of Self-Regulation (FCSSR).

Pre-service Teacher: Undergraduate students enrolled in a physical education teacher education program with an emphasis on preparation for teaching K-12 public/private students upon completion of the program.

Self-Regulation: Self-generated thought, feelings, and behaviors that are planned and cyclically adapted based on performance feedback to attain self-set goals (Zimmerman, 1989).

Strategy Implementation: One of three subcategories of self-regulation as assessed by the Five-Component Scale of Self-Regulation (FCSSR). Strategy implementation scores are derived from the addition of the 15 questions within that category.

Strategy Monitoring: One of three subcategories of self-regulation as assessed by the Five-Component Scale of Self-Regulation (FCSSR). Strategy monitoring scores are derived from the addition of the 15 questions within that category.

Weekly study time: How much time students indicate they study within a week.

Year in Program: Category of undergraduate pre-service teachers indicated as freshman, sophomore, junior, or senior.

CHAPTER 2

Review of Literature

This chapter covers related literature necessary to conduct the proposed self-regulation study. It is subdivided into an overview of self-regulation, models of self-regulation, and research on student self-regulation.

Defining Self-Regulation

Problems in a United Definition.

Self-regulation research spans many disciplines, including social psychology and personality domains (Boekaerts, Pintrich, & Zeidner, 2000). Self-regulation has predominantly been studied in the social sciences (i.e., educational, organizational, clinical, and health psychology). Studies utilized self-regulation under different human functions, such as through personality, personal goals, behavioral aspects of human condition, or social cognitive realm of daily life. Researchers in the field of self-regulation have begun to break down the various perspectives taken by those in the field of self-regulation and have narrowed the focus to further understand the phenomenon of self-regulation. Boekaerts et al. (2000) stated, “we have not strived for genuine comprehensiveness and it is clearly impossible to cover the entire range of topics that constitute the phenomenon of self-regulation and do justice for each aspect” (p. 4). Furthermore, the authors stated, “it is clear from the diversity of the chapters in this handbook (The Handbook of Self-Regulation) that self-regulation is a very difficult construct to define theoretically as well as to operationalize empirically” (p. 4).

Commonalities in Definitions.

Regardless of the self-regulatory model, most self-regulation theorists agree that self-regulation is a personal process of goal attainment. Although these overall categories are accepted by theorists, the problem often lies as to which category of self-generated thoughts, feelings, or actions should be emphasized over another. A current literature review suggests that the different self-regulatory models such as those representing the social psychology and the social and personality perspectives do not work in opposition of each other (Boekaerts, Pintrich, & Zeidner, 2000). Rather, each model represents a different emphasis depending on which scientific community is using it.

Definition of Self-Regulation.

Zimmerman (2000) refers to self-regulation as “self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals” (p. 14). Self-regulation has been mostly acknowledged and framed within Bandura’s (1986) Social Learning Theory. This theory is used to analyze human learning and self-regulation regarding reciprocal causations involving the triad of personal, behavioral, and environmental determinants. The underlying emphasis behind social learning theory is the interaction of the environment and the behavior of the learner and how it reciprocally influences thought processes.

Historically, the students’ ability to self-regulate actions has been associated with willpower. Bandura (1986) hypothesized that a student with high levels of willpower is able to forego influences such as television and social events in order to attain a goal. On the other hand, Bandura (1986) hypothesized students who lack willpower will not work as diligently. Zimmerman and Schunk (2003) summarized this tenet by saying:

Students who rely on increased will power to succeed often make self-debilitating attributions especially if they view willpower as a fixed trait they lack. Failure to learn leads students to make attributions to inherent personal deficiencies, which is demotivating and self-handicapping. Thus, the practical application of willpower in the classroom was thought of as defunct and provided little guidance to teachers assisting in the self-regulation of their students (p. 445).

Zimmerman and Schunk (2003) suggested that teachers and faculty can play an important role in helping students monitor their environment regarding their cognition and behavior, as well as how to utilize self-management and self-incentives strategies to increase their effectiveness. This may suggest that teachers assist their students in developing the capability to self-regulate personal, behavioral and environmental factors. This self-management is based on processes of self-observation of performance, the judgmental processes of one's performance, and specific self-reactive qualities, which take into account the thoughts, feelings and actions associated with the final outcome (Bandura, 1986). Self-regulatory theorists suggest that if students have the ability to display this level of cognitive functioning, only then will they be effective in planning, executing, and attaining their goal.

Theories and Models of Self-Regulation

Social Psychological Perspectives of Self-Regulation.

Social Cognitive.

The social cognitive perspective suggests that self-regulatory behavior relies on feedback that comes from their personal affective, cognitive, motivational, and behavioral domains which are used to modify their strategies and behaviors when they

are initially unable to meet the demands of their goals (Cleary & Zimmerman, 2004). In general, self-regulated learners are considered to be proactive learners who incorporate various self-regulation processes (e.g., goal setting, self-observation, and self-evaluation) with task strategies (e.g., study, time-management, and organizational strategies) and self-motivational beliefs (e.g., self-efficacy, intrinsic interest) (Cleary & Zimmerman, 2004).

According to Zimmerman (2000), the social cognitive model of behavior emphasizes four hierarchal aspects of self-regulation: observation, emulation, self-controlled, and self-regulated. This hierarchy begins with social influences and ultimately ends with self-influences. In the *observation* phase of cognition, the learner is focused primarily on social modeling and verbal instructions associated with the task. Once the learner understands the social observations, *emulation* will then take place. This is the learner's attempt to recreate and demonstrate the skill demonstrated by the teacher. After emulation, coupled with social guidance and feedback, the learner can then begin to influence his own learning through his own *self-control*. In this stage, the learner begins to internalize the skill, recreating and ultimately adapting it. The final stage in the social cognitive model relies on the learner to *self-regulate*, or adjust the skill to changing contextual situations.

Consistent with Bandura's Social Cognitive Theory, the social cognitive perspective of self-regulation also works from a three-phase covert feedback model (Zimmerman, 2000). The components include forethought (i.e., thinking before an action), performance/volition control (i.e., thinking during an action), and self-reflection (i.e., thinking after an action). It is assumed that if one has the ability to proficiently

utilize these three aspects of cognition, she will ultimately be able to regulate her own behavior and learning outcomes. This cycle is completed when the three components of this process impact the forethought phase of a future learning attempt (Cleary & Zimmerman, 2004).

The triad of forethought, performance/volition control, and self-reflection can be further subdivided. *Forethought*, which is a precursor to an action, utilizes task analysis and self-motivational beliefs to assist in learning. Task analysis involves the important components of goal setting and strategic planning. These specific thoughts are used to design and develop plans of actions to accomplish a desired outcome. Self-motivational beliefs on the other hand deal more with the motivational aspects of self-efficacy, outcome expectations, intrinsic interests, and goal orientation. To ensure the ultimate success of the goal, the self-regulated individual must be motivated and believe in success. In essence, successful self-regulated learners are mindful of the learning task and are confident in its success as they proactively set goals and plan accordingly for attainment of those goals (Cleary & Zimmerman, 2004).

The second component of the triad, *performance/volition* control, focuses on the learner's ability of self-control and self-observation. Self-control processes, such as self-instruction, imagery, attention focusing, and task strategies, help learners and performers to focus on the task and optimize their effort (Zimmerman, 2000). In addition, self-observation refers to monitoring one's own performance through self-recording and self-explanation (i.e., keeping a journal).

The third component of the triad, the *self-reflection* phase, identifies self-judgment and self-reaction as its key components. Self-judgment involves evaluating

one's performance with its causal attribution against the end result, as well as self-monitoring information with a goal (Zimmerman, 2000).

In essence, after engaging in a learning situation, sophisticated self-regulated learners typically evaluate their performance relative to self-standards (e.g., previous test scores), attribute poor performance to faulty strategies (i.e., their strategic plan), and will make strategic adjustments before the next learning situation (i.e., study for six hours rather than four hours) (Cleary & Zimmerman, 2004, p. 539).

Behavioral Self-Regulation.

Unlike the social cognitive perspective of self-regulation which places emphasis on the environment as having the major effect of self-regulatory skills, Carver and Scheier (2000) have emphasized human behavior and emotion as major underlying factors of self-regulation. According to the behavioral theory of self-regulation, human behavior is thought to be driven primarily by personal goals individuals set for themselves coupled with feedback control. Goals are assumed to reinforce learners' behaviors, direct their activities, and give meaning to life. Thus, lack of goals suggests an inability to self-regulate.

Like the social cognitive perspective of self-regulation, the behavioral view of self-regulation also places emphasis on the use of feedback loops. According to Behavioral Self-Regulation (Carver & Scheier, 2000), this feedback loop is constructed through the use of an input function, a reference value, a comparator, and an output function. The *input function* can be best thought of as perceptions or sensory information. *Reference values* can be best described as the goals people are interested in and whether

their desire to achieve these goals influences a willingness to self-regulate. *Comparators* are strategies that make comparisons between input and reference value. According to the theory, either the comparisons are different with each other or they are the similar in nature. Finally, *output functions* are utilized whether there are discrepancies between the input received and the goal one desires to attain.

In general, Carver and Scheier (2000) believed that behavior is directed by goals and controlled by feedback.

[They also] believe that the experience of affect (and of confidence versus doubt) also arises from a process of feedback control, but a feedback process that takes into account more explicitly temporal constraints and that confidence and doubt yield patterns of persistence versus giving up and that these two responses to adversity form a dichotomy in behavior (p. 78).

Goal Networks.

The third theory related to social psychological perspectives of self-regulation emphasizes goal attainment and the networking of those goals. According to this self-regulation theory (Shah & Kruglanski, 2000), goals are seen as knowledge structures that should be addressed cognitively with the same processes one uses when attaining knowledge. This theory also claims that goal attainment may have a top-down approach. Shah and Kruglanski assume that activation of goals are spread downward to lower order activity means whose completion is essential for goal attainment. It is hypothesized that if the underlying means are perceived as attainable, then the likelihood that the goal will be attained is increased. Utilization of this goal-means association can potentially increase

the likelihood that goal attainment will be directly influenced through self-regulatory functions.

Also indicated in the theory of goal-means association is the idea that goals can be attained through *equifinality*, meaning goals can be attained through a variety of actions, or attained through *multifinality* where means may serve more than one goal. For example, one's ability to demonstrate intelligence could be done through different means (equifinality) and the use of walking (means) could be considered useful for walking or exercising (multifinality). In addition, goals can be associated "laterally," where one mean can assist in the attainment of multiple goals, such as walking could be used as transportation and as exercise. It is through the utilization and regulation of these means that goal attainment is optimized.

Personality Perspectives.

Functional-Design Approach.

Self-regulation can also be theorized through utilization of what is known as "functional-design." Function-designs of self-regulation analyze the basic properties underlying motivation and self-regulation. Kuhl (2000) described this difference in terms of learned helplessness. A person who continuously fails may be viewed by cognitive content-based theorists as someone who has lost motivation due to his own developed negative beliefs about his ability to fail. According to a functional account, Kuhl (2000) contended that "pessimistic beliefs and motivational deficits are consequences rather than causes of performance deficits that occur when people are confronted with uncontrollable failure" (p. 112). A held belief does not always mean that the goal is attainable. Rather, the underlying ability to achieve the goal must first be in place, which begets the

attainment of the goal. Kuhl also indicates that this functional framework is meant to extend and not replace content-based approaches because it is used to identify mechanisms that affect self-regulation behavior beyond the self-regulatory effects of cognitive beliefs and it's their strategies.

Cognitive-Social Perspective.

A second self-regulatory theory emphasizing personality perspectives looks at self-regulation from a cognitive-social perspective, which emphasizes cognitive knowledge as indicators for both personality and influences on self-regulation as it pertains to cognition (Matthews et al., 2000). It is assumed in this theory that styles of self-regulation are very much a part of one's personality. It is deemed necessary to understand the "underlying cognitive architecture" of the learner as to how his self-regulatory processes will function. For example, an important personal trait that indicates of self-regulatory adaptation is that of neuroticism. Matthews et al. state that

neuroticism relates to various self-referent processes, including appraisals of threat and loss of control across various contexts, negative appraisals of the self as a social agent associated with shyness, and negative or maladaptive metacognition. Neuroticism also may relate to attributions of hostility to others, via its association with emotionally reactive aggression where more neurotic subjects also prefer to cope through emotion focus and disengagement, as opposed to task focus (p. 200).

Thus, personality traits such as neuroticism can alter effects on goal attainment. It may change metacognitive routines soundly structured under normal circumstances. As a result, neuroticism may hinder someone's ability to self-regulate effectively.

Commonalities in the Theories.

Depending on the self-regulation theorists' philosophical approach, this general functional construct can be reflected in each of the listed theories above. Whether emphasizing self-regulation based on a social psychological perspective or a personality perspective, it will still reflect the important component of one's own thoughts, feelings, and actions of the self-regulated learner.

Behavioral self-regulation theorists place emphasis on how human behavior and emotion have impact on an individual's self-regulation. Functional-design theorists place emphasis on the learned helplessness and feelings of someone as to whether they will be self-regulated or not. In both cases, the foundation of sound self-regulatory functioning is placed on the thoughts, feelings, or actions of the person. The same can be said of goal network theorists who believe the thought process of one goal can assist other goals. Cognitive-social theorists' estimate cognitive foundations are based on someone's identified thought process. In any theoretical self-regulatory model, thoughts, feelings, and actions are necessary for the attainment of goals, but all emphasize different aspects of it.

Developmental Aspects of Self-Regulation

As research has spanned the different theoretical models, it has also attempted to identify the self-regulatory process across the lifespan (Cooper, 2007). This review will assess those closely related to the formulation of self-regulation from childhood to adulthood.

Self-Regulation and Childhood.

Of the limited existing research with children in different subject domains, most prevalent research has been conducted in the areas of reading and writing emphasizing children's psychological development. Cooper (2007) addressed the need to focus more on children's psychological development through the utilization of books. Cooper argued that early education experts teach children how to read, but do not emphasize why or what to read because many teachers' have limited knowledge of the reading field or its developmental capabilities. Cooper suggested that what is ultimately necessary when teaching reading is whatever children are reading should somehow practice some aspect of his or her potential self.

Studies analyzing the integration of self-regulation as it pertains to reading and writing indicate that there are two necessary variables needed to teach students: self-efficacy and self-regulation. Schunk and Rice (1989) analyzed fourth and fifth-grade children with low reading comprehension who received interventions through one of three conditions consisting of process, product, and general goals of understanding. The teacher used modeling for 35 minutes per day for 15 consecutive school days to teach questions students should ask themselves while analyzing what they had read. Of the questions they were to ask to rehearse, the *process and product goal* students were told to try to answer questions about what they read. On the other hand, the *general* group was just told to do their best. As a result, it was concluded that process- and product-goal children demonstrated higher self-efficacy in comprehension than did the general student (Schunk & Rice, 1989). In addition, process-goal children demonstrated higher reading comprehension achievement than did product- and general-groups. As a result, modeling,

as consistent with social cognitive theory, is demonstrated as an important indicator to the learner's emulation and emulation with regards to learning.

A major strength in this study was the clear division of groups (process, product and general) and the day to day consistency of the intervention. The treatment groups were given ample opportunity and repetition to learn the skill necessary to assess main ideas of reading. Sufficient modeling and feedback was given to the treatment groups, which enhanced their ability to assess main ideas. A clear weakness in this study was that although it was informative with regards to the first two levels of self-regulation, skill development of *observation* and *emulation* of learning, it did not specifically address overall self-regulated levels of the students (Schunk & Rice, 1989).

A follow up study by Schunk and Rice (1991) using the same methodology of their previous study (Schunk & Rice, 1989) also indicated the importance of modeling with the addition of feedback. Modeling coupled with feedback resulted in students demonstrating higher self-efficacy and comprehension than did process- and product-goal learners. Utilization of a feedback loop (Zimmerman, 2000) is a better covert tool to enhance reading comprehension than just through modeling alone. As with the previous Shunk and Rice (1989) study, a weakness in this study was its shortcomings in the identification of overall levels of self-regulation (Schunk & Rice, 1991).

Self-Regulation and Middle-Childhood.

As indicated by literature, self-regulation appears attainable in childhood using appropriate modeling and feedback. But is this the only predictor of future success in self-regulation? A longitudinal study (Coleman et al., 2006) was conducted with children initially at 4-5 years (time 1) of age and again at ages 8-9 (time 2) assessing parental

practices of self-regulation. Results indicated that high levels of maternal warmth along with low levels of punitive discipline at the time of the initial data set were associated with higher levels self-regulation when they were analyzed a second time. It was concluded that children whose mothers did not rely on physical discipline strategies during early childhood were “more likely than other children to be described as competent regulators of their attention, behaviors, and emotions in middle childhood” (p. 432). This result is consistent with previous findings that early caregiver interactions can affect self-regulation (Demetriou, 2000; Kopp, 1982).

Weaknesses in this study lie in the assessment of self-regulation. Self-regulatory data obtained for this study were collected from a 12-item self-report questionnaire. The Behavioral Problems Index (Peterson & Zill, 1986) assessed self-regulation as it pertains to behavioral aspects of children’s affective, attentional and behavioral domains. Assessment of the self-regulatory conclusion in this study can only be extrapolated in the behavioral models indicated in this chapter. Therefore, social cognitive researchers need to assess this same population of children utilizing the theoretical models based on that of social cognition model of self-regulation processes of self-generated thoughts, feelings and actions used to achieve personal goals.

In addition to parental influences upon self-regulatory abilities, it has been suggested that overall academic performance and motivation deteriorate as children grow into middle childhood. In an attempt to identify why and how academic performance and motivation begins to decline, Dembo and Eaton (2000) listed important variables found in research: motivation, methods of learning/learning strategies, use of time, physical

environment, social environment, and performance. With regards to *motivation*, Dembo and Eatons summarized that

to control motivation, students need to set goals, develop positive beliefs about their ability to perform academic tasks, and maintain these beliefs while faced with the many disturbances, distractions, occasional failures, and periodic interpersonal conflicts in their lives (pp. 446-447).

It is also important to acknowledge that, in order to increase *methods of learning/learning strategies*, metacognitive strategies first are taught to the learner.

The way middle children utilize their time may impact their goal attainment. As they move into less structured environments (e.g. middle school settings) where there are fewer restrictions, time management and procrastination can become important factors in their lives. Dembo and Eaton (2000) addressed these specific issues by arguing that time management and problems with procrastination are critical self-regulatory skills that may vastly affect academic and nonacademic outcomes if not controlled.

Arguably one of the most important threats to the ability to self-regulate while in transition into middle childhood is the change in social environment.

Establishing a goal for developing social competencies in middle-level schools is not only important for learning how to seek academic performance but also for improving students' school adjustment and retention (Dembo & Eaton, 2000, p. 481).

In addition to influences of school itself, this time period is marked by puberty, when the social influences of peers become more apparent as learners try to protect their esteem and avoid looking foolish or dumb. Consequently, protection of their self-worth

becomes more of a driving factor. If strong enough, social and peer influences could trump the learner's natural ability to self-regulate. Dembo and Eaton (2000) proclaimed that it is important to teach self-regulation skills not only in elementary school, but continue teaching these skills into the middle school years as well.

Controlling the environment is also an important determinant of maintaining adequate self-regulatory abilities. As the environment changes, so do the distractions. Zimmerman and Pons (1986) assessed forty high achieving and forty low achieving tenth grade students to assess their self-regulatory strategies during class, homework, and while studying. As a result, they discovered that those who were considered high-academic achievers had a better ability to restructure their environment to meet their goals than were low-academic achievers. Finally, *performance* is the last obstacle children in middle-level schools face. Students who self-regulate in their learning and performance have a better chance of success.

Self-Regulation as Function of Age and Gender.

Self-regulation as a function has also been researched with regards to gender and age. In a study of self-regulation from the Longitudinal Survey of Youth (NLSY), Rafaelli and Crockett (2005) assessed student's self-regulation as compared to gender. As a result, it was determined that girls exhibit significantly higher levels of self-regulation than did boys. This finding reflected past research (Coleman et al., 2006; Kochanska, Murray, & Harlan, 2000; Murphy et al., 1999; Stifter & Spinrad, 2002) which found that girls scored higher in self-regulation than boys did.

Studies have indicated (Demetriou, 2000; Rafaelli & Crockett, 2005) that self-regulation increases from middle childhood (ages 4-5) to early adolescence (ages 8-9),

but not from middle childhood to early adolescence (ages 12-13). It is theorized that overall increase in self-regulation will plateau over time as people learn how to implement it. Thus, self-regulation increases will not continue to rise at the rate it did at a younger age.

Self-Regulation and College Students.

Zimmerman (2002) described self-regulation as “not a mental ability or an academic performance skill; rather it is the self directive process by which learners transform their mental abilities into academic skills” (p. 65). In an analysis of self-regulatory research, Zimmerman (1998) indicates that, for college students to be successful learners, they must possess the component skills of 1) setting proximal *goals*, 2) *adopting strategies* for the selected goal they wish to attain, 3) *monitoring* the progress of that goal, 4) *restructuring* physical or social context if need be to attain the goal, 5) using *time* efficiently, 6) *self-evaluating* methods being utilized, 7) *attributing* causation, and 8) *adapting* future methods.

Self-Regulation and Teachers as Students.

It is believed that cognition functioning must be carefully cultivated in undergraduate pre-service teachers. Feiman-Nemser (2001) stated that:

According to one school of thought, novices rely on trial and error to work out strategies that help them to survive without sacrificing all the idealism that attracted them to teaching in the first place. Another school of thought is beginning teachers face personal concerns about acceptance, control, and adequacy which must be resolved before they can move on to more professional considerations about teaching and student learning (p. 1027).

Ravindran et al. (2005) argued that most teacher education programs require students to have an underlying ability to integrate multiple sources of knowledge and multiple experiences used in the development of expertise in that field. Success may depend on whether the pre-service teacher has this ability. Therefore, it is important to focus on the cognitive engagement of the pre-service teacher.

It is important to create a deeper processing level within the learning environments of our pre-service teachers, as deep processing involves connecting the incoming information with existing knowledge to create a more complex knowledge structure (Anderson & Reder, 1979). This process of learning not only needs to be accomplished through pre-service teacher's specific content knowledge so he/she may understand what is being taught, but also through their pedagogical knowledge as well so there is an understand of how to disseminate information to their students. Miller, DeBacker, and Greene (1999) studied the relationship between 180 college students' perceptions of the incentive value of course work and their beliefs that course performance is instrumental. Results found that college students who perceived that their current learning was instrumental to their future success as teachers had higher learning goals and reported greater intrinsic valuing of their learning than did their peers. If college students believed that their immediate workload could positively impact their work in the future, they tended to engage more cognitively in the learning process.

Sheldon and DeNardo (2005) analyzed the comparisons of higher-order thinking skills among 116 prospective freshman and 130 upper-level pre-service music education teachers. This study assessed their ability to demonstrate differentiated levels of higher-order thinking skills in providing description of and inference about a series of music

interactions in video segments. Participants watched a videotape and simultaneously wrote as much as they could about what they observed. Participants were then asked to verbally respond based on factual and inferential information from the video. Due to the cognitive nature of their program, upperclassman demonstrated greater higher-order thinking skills compared to prospective freshmen. Upper-level classmen generally demonstrated greater abilities to describe and infer compared to prospective freshman. Differentiation between mean scores and variability between the subjects in seemed to be a function of level of expertise derived from participation in a music teacher training program. While the development could be a result of many factors that affect the university student, inclusion of courses into the teacher education program that concentrate on higher-order thinking and problem solving throughout the entirety of the music education degree program could help in early development of teacher expertise in this area.

A weakness in this study is the authors did not consider self-regulation levels of the two cohorts of students. Since the study identified higher-order thinking, it would have been interesting to indicate how they thought with regards to higher-order thinking rather than just assessing its' existence in the study.

Ravindran et al. (2005) analyzed the relationship among achievement goals (learning and performance), epistemological beliefs (innate ability, certain knowledge, simple knowledge, quick learning, and omniscient authority), cognitive engagement (meaningful and shallow), and application learning of 101 pre-service teachers. Participants of the study took the Epistemological Beliefs Inventory and the modified Motivation and Cognitive Engagement Inventories before and after their enrolled

educational psychology course. When the dichotomy between meaningful and shallow cognitive engagement was assessed, the combination of goal and belief variables were involved in the explanation of variance. If the student had high goals and believed his or her goals would make a difference, then cognitive levels would increase. Consequently, the results in this study turned into a positive correlation with learning, where performance approach goals were positively correlated with shallow cognitive engagement which was negatively correlated with learning. These results suggests that although instructors must ensure that students know more ways to approach learning than just the use of shallow strategies, instructors also must evaluate and challenge the beliefs that may be supporting a reliance on shallow strategies.

Few studies have assessed self-regulation as it pertains to pre-service teachers (Bhattacharyya, 2005; Hwang & Vrongistinos, 2002; Kremer-Hayon & Tillema, 1999; Maclellan & Soden, 2006; Selvester, 2005). Maclellan and Soden's (2006) study is the only one to date that focuses on self-regulation through a social cognitive perspective. All other studies utilized a hybrid model of self-regulation in the analysis, while some employed behaviorist self-regulation and others by means of a social-cognitive and behaviorist perspective. In Maclellan and Soden's pilot study, 75 first year undergraduate primary education students enrolled in a two-semester module entitled, *Understanding Yourself as a Learner*, were assessed utilizing the original Five-Component Scale of Self-Regulation (FCSSR) (Martinez-Pons, 2000). Results of the pilot study indicated that after pedagogical intervention, the three main elements of self-regulation (goal setting, strategy implementation, & monitoring) increased.

Although Maclellan and Soden (2006) studied pre-service teachers' self-regulatory abilities as pre-service teachers, the subject population was first year undergraduate students who have not had any learning experiences within a physical education teacher education (PETE) curriculum. Instead of analyzing self-regulatory capabilities of students before core PETE classes, further studies need to look at the self-regulatory capabilities of experienced pre-service teachers after their education experiences possibly during student teaching or even after degree completion.

Self-Regulation and Pre-service Physical Education Students.

Of the limited self-regulatory studies conducted with pre-service teachers', focus on the population of physical education pre-service teachers enrolled under a PETE. As with any pre-service program, it is the overall goal of PETE programs across the country to produce well-trained neophyte pedagogues. Although it is argued that teaching "expertise" is near impossible to attain upon completion of a PETE program, focus can still be given to increased situational-decision-making processes through concepts such as self-regulation.

Construction of an Expert Teacher.

David Berliner (1986) identified standard characteristics of an expert pedagogue and how they utilize content knowledge while teaching. One of many aspects of teaching excellence in a pedagogue is in the teacher's automaticity, or the ability to perform tasks with limited covert thought processes. Bloom's (1986) study of experts in various professions who demonstrated automaticity in their domain, indicated a great deal of time was necessary to practice that specific skill to attain proficiency. "Once their skill was developed to a high level of automaticity it could be maintained with very little practice

or thought.” (Berliner, 1986, p. 26). Since pre-service teachers traditionally are not allotted the appropriate in-service training time necessary to achieve “teaching automaticity,” there should be focus on “cognitive automaticity,” thus achieved by a student who is meta-cognitively, motivationally, and behaviorally active participants in their own learning (Zimmerman & Martinez-Pons, 1986a).

Dodds (1994) stated that “teaching expertise in physical education is a global construct that refers to the ease with which teachers perform their work to maximize student learning” (p. 35). The term “global” indicates a plethora of knowledge construction which covers many domains. Shulman (1987) described teaching expertise as content knowledge, pedagogical knowledge, curricular knowledge, knowledge of the learner and the learner’s characteristics, knowledge of schools and districts beyond the classroom, and knowledge of overall educational purposes and values. Teaching expertise is also indicated in other areas which include the ability systematically and appropriately utilize various self-regulatory skills to accomplish goals which can best be taught, applied and utilized in their respective PETE program. Griffey and Podemski (1990) also listed characteristics of a quality physical education teacher: being a reflective practitioner and quality decision maker. Only through the utilization of these schemata of rich detailed knowledge can pre-service teachers become well adaptive future self-regulated pedagogues.

Summary

The utilization of baseline self-regulatory capabilities of pre-service teachers as reported in Maclellan and Soden (2006) could be a starting point in identifying what self-regulatory elements are absent in pre-service PETE programs. Assessing pre-service

teachers through their teacher education program could give better insight as to what self-regulatory skills are necessary to maximize learning in a PETE program. Potentially this could result in higher in-service physical education retention rates, more job satisfaction, and increased learning of the students these teachers service.

Conceptually, social cognitive self-regulation increases the ability of personal goal attainment. Whether analyzing children or adults, self-regulation has continued to demonstrate a person's ability to positively affect cognitive abilities regardless of the field of study or the conceptual nature of its' framework (i.e. behavioral self-regulation, functional design self-regulation, etc). Since self-regulation has been analyzed across social science fields, more continued research would assist in understanding its' often complex nature. With regards to pre-service teachers, continued research could be used to strengthen the fundamental core of university programs which instruct future educators. Based on the research, it is important to continue to identify ways in which self-regulation can positively affect decision making.

CHAPTER 3

Methodology

Introduction

The purpose of this study was to examine the self-regulatory processes of physical education teacher education (PETE) students as measured by a modified version of the Five-Component Scale of Self-Regulation (FCSSR). The relationships between the independent variables were examined by implementing descriptive statistics and factorial analysis of variance (ANOVA). This chapter will introduce the methods in which this research investigation was conducted. It is separated into the five sections of: approval, study design, participants, instruments, and procedures.

Approval

A proposal of research was first presented to the dissertation committee, then to the Institutional Review Board at the University of New Mexico and at the University of Texas at Arlington (Appendix B & C). The investigator attained IRB approval from both the degree granting institution as well as the academic institution of employment through which the data were collected.

Study Design

This study used quantitative methods for its analysis and was non-experimental as no interventions were administered. It was also descriptive and comparative in nature because patterns among first year, second year, third year and fourth year pre-service teachers were described, as well as the relationships between variables such as self-regulation processes (goal-setting, strategy implementation, strategy monitoring).

Demographic information, such as gender, year in program, current GPA, anticipated

GPA upon graduation, and weekly study time were collected. Participants of this study were asked to reflect on their own self-regulatory functioning as it pertained to their academic education, which was assessed through the modified FCSSR.

Factorial Analysis of Variance (ANOVA) was used to analyze self-regulation and its subcomponents (goal-setting, strategy implementation and strategy monitoring) between subject groups. The variables for the study were collected through self-report from the modified version of the Five-Component Scale of Self-Regulation (FCSSR) (Maclellan & Soden, 2006) (Appendix A).

Participants

Participants were solicited from among the pre-service physical education students enrolled in their degree plan from a state university in the southwest. Participants were selected based on inclusion criteria that specified that they were enrolled at the university and were considered pre-service teachers as indicated by their program of studies entitled *Pedagogy All-Level Certification*. From the estimated total of 201 students in the program, 145 agreed to participate in the study. Of the 145 students, 90 were male and 55 were female. Four of the students' data could not be included because of incomplete questionnaires.

According to power tables (Keppel & Wickens, 2004) utilizing single factor ANOVA's with 4 levels, a minimum of 17 participants were necessary per variable group based on a large effect size (.15) at the .05 alpha level, and at 80% power. As a result, this study's projected sample size necessary for adequate power would require roughly 306 students as it utilized a five factor factorial model with 18 levels. These levels include *gender* (2) of male and female; *year in program* (4) of freshman, sophomore, junior and

senior; *GPA* (4) of 2.0-2.49, 2.5-2.99, 3.0-3.49, and 3.5-4.0; *anticipated GPA* (4) of 2.0-2.49, 2.5-2.99, 3.0-3.49; and 3.5-4.0, and *weekly study time* (4) of 1-3 hours, 4-6 hours, 7-9 hours, and <9 hours.

Descriptive Characteristics of Respondents

In this study, the investigator's hypotheses attempted to identify OVERALL self-regulation as it pertains to pre-service teachers, and also issued hypotheses on this population's abilities in goal-setting, strategy implementation, and strategy monitoring as self-reported through the FCSSR. In addition, the researcher also attempted to identify potential differences within certain demographic sub-populations. Accordingly, the following Tables include the demographic information for the participants of this study with regards to their gender, year in program, current GPA, anticipated GPA upon graduation, and weekly study time.

Pre-Service Teachers by Gender.

Table 1 illustrates the number of participants who responded in this survey by gender. Of those responding, 90 (63.8%) were female and 51 (36.2%) were male.

Table 1

Gender

Male Participants	Female Participants
90 (63.8%)	51 (36.2%)

Pre-Service Teachers by Year in Program.

Table 2 illustrates the Year in Program category of participants who responded in this survey. Of the participants who responded, five (3.5%) were freshman, 24 (17%) were sophomores, 63 (44.7%) were juniors and 49 (34.8%) were seniors.

Table 2

Year in Program Listing

Freshmen	Sophomores	Juniors	Seniors
5 (3.5%)	24 (17%)	63 (44.7%)	49 (34.8%)

Pre-Service Teachers by GPA.

Table 3 illustrates the Grade Point Average (GPA) category of participants who responded in this survey. For this study, GPA was categorized beginning with a 2.0 and ending with a 4.0 since the range included the minimum requirement of any student within the College of Education at the university and the highest GPA to be earned. These categories were chosen to allow for sizable enough response cohorts that valid comparisons may be made. As a result, GPA is categorized as 2.0 – 2.49, 2.5 – 2.99, 3.0 – 3.49, and 3.5 – 4.0. Of the participants who responded, one student fell below the minimum requirement of a 2.0 GPA. This student's GPA was self-reported as a 1.7 GPA. Of the rest of the participants, 15 (10.6%) participants were between a 2.0 – 2.49 GPA, 46 (32.6%) were between a 2.5 – 2.99 GPA, 55 (39%) were between a 3.0 – 3.49 GPA, and 24 (17%) were between 3.5 – 4.0 GPA.

Table 3

Current GPA

Below 2.0 GPA	2.0 – 2.49 GPA	2.5 – 2.99 GPA	3.0 – 3.49 GPA	3.5 – 4.0 GPA
1 (.07%)	15 (10.6%)	46 (32.6%)	55 (39%)	24 (17%)

Pre-Service Teachers by Anticipated GPA upon Graduation.

Table 4 illustrates the anticipated GPA category of participants who responded in this survey. Similar to GPA data, anticipated GPA was also categorized between a 2.0 and 4.0. These categories were chosen to allow for sizable enough response cohorts that valid comparisons may be made. Thus, anticipated GPA was categorized from 2.0 – 2.49, 2.5 – 2.99, 3.0 – 3.49, and 3.5 – 4.0. With regards to these data, 0 (0%) participants anticipated their GPA would be between a 2.0-2.49 upon graduation, 12 (8.5%) participants anticipated their GPA would be between a 2.5 – 2.99 upon graduation, 88 (62.4%) anticipated their GPA would be between a 3.0 – 3.49 upon graduation, and 41 (29.1%) anticipated their GPA would be between a 3.5 – 4.0 upon graduation.

Table 4

Anticipated GPA

2.0 – 2.49 GPA	2.5 – 2.99 GPA	3.0 – 3.49 GPA	3.5 – 4.0 GPA
0 (0%)	12 (8.5%)	88 (62.4%)	41 (29.1%)

Pre-Service Teachers Weekly Study Time.

Table 5 illustrates the amount of time per week in which participants studied for class.

For this study, class study time per week was categorized in three hour increments not to exceed four levels for the variable of weekly study time. Thus, it was categorized from 1-3 hours, 4-6 hours, 7-9 hours, and 9 or more hours respectively. As a result, 31 (22%) participants reported they studied between 1 to 3 hours per week, 72 (51%) participants reported they studied between 4 to 6 hours per week, 30 (21.3%) participants reported they studied between 7 to 9 hours per week, and 8 (5.7%) participants reported they studied more than 9 hours per week.

Table 5

Weekly Study Time

1-3 Hours Per Week	4-6 Hours Per Week	7-9 Hours Per Week	9 < Hours Per Week
31 (22%)	72 (51%)	30 (21.3%)	8 (5.7%)

Instrumentation

The instrument used in this study was the modified version of the Five-Component Scale of Self-Regulation (FCSSR) (Maclellan & Soden, 2006). This instrument was originally developed by Manuel Martinez-Pons (2000) as a way to assess undergraduates' abilities to self-regulate based on the social construct of self-regulation. In addition, this instrument "has the construct of self-regulation as its exclusive focus, and it seems to be consistent with the assumptions of social cognition" (Maclellan & Soden, 2006, p. 100). Although this instrument uses the same three core categories (goal setting, strategy implementation, and strategy monitoring) as did the original drafted by Martinez-Pons (2000), it was modified by Maclellan and Soden (2006) to add demographic information not included in the original. Further modifications were made by the primary researcher of this study to include certain demographic information (GPA, gender, etc.) that the original questionnaire did not ask.

This questionnaire analyzed self-regulation from a multi-faceted view. The questionnaire was comprised of 45 self-regulation questions related to **Goal Setting** (15 items), **Strategy Implementation** (15 items), and **Strategy Monitoring** (15 items) (Appendix A). This questionnaire utilized a Likert scale system ranging from "all the time" (4) to "never" (1). Overall self-regulation scores are attained by adding the total score given by each subscale (goal-setting, strategy implementation and strategy

monitoring) whereas the higher the total-score, the higher the respondent's level of self-regulation.

Reliability.

Reliability is the extent to which the measurements of a test remain consistent over repeated tests of the same subject under identical conditions. For example, if the FCSSR were to be administered a second time to the same pre-service teachers, the instrument should record the same value in previous uses. According to Maclellan and Soden (2006), the Cronbach alphas before intervention were 0.88 for goal-setting, 0.90 for strategy implementation, and 0.92 for monitoring, and after the intervention, were 0.88, for goal setting, 0.79 for strategy implementation and 0.92 for monitoring. In addition, the researcher of this investigation conducted the same Cronbach's analysis and found the alphas to be .863 for goal-setting, .837 for strategy implementation, .857 for strategy monitoring, and .930 for overall self-regulation. These data suggested that the FCSSR scale had internal reliability.

Validity.

Construct validity attempts to determine a relationship between the theoretical concept of the instrument with the instrument itself. Construct validity is the extent to which an instrument demonstrates it measures what is being stated. This instrument was first created by Martinez-Pons (2000) to test academic self-regulatory behavior addressing academic motivation, goal-setting, strategy usage, self-monitoring, and strategy adjustment. The original author used factor analysis to test the convergent and discriminant validity of the model of self-regulated transfer. Maclellan and Soden (2006) utilized the same study but did not change the construct of the test, rather only changed

the demographic information in its modification. As a result, the FCSSR was determined to demonstrate validity on past usage and thus utilized in the current analysis of pre-service teachers.

Procedures

The following section presents a description of how this study was conducted:

Administration.

The modified FCSSR was administered once to pre-service physical education students under the PETE program. The investigator contacted all instructors with direct teaching interaction with any PETE student. A list of instructors was obtained from the head administrative assistant of the Kinesiology Department, as well as the undergraduate advisor to all pedagogy students.

Upon gathering all necessary contact information, the investigator then sent instructors an email to their university email account. Within the content information of the email, the investigator asked the instructors to identify the number of prospective participants who might be available for the study and whether they would be willing to make their students available for the study. Also enclosed in the email was the website students could access to participate in the survey. In addition, the investigator contacted each program coordinator by email one week after the initial email correspondence. No additional emails were sent after two attempts as to avoid the harassment of both teacher and student as 145 students had emerged. Upon completion of the surveys, an email was sent out to those instructors who agreed to make their students available to thank them for their involvement.

All participants took the survey on the internet via the utilization of *Survey Monkey*. *Survey Monkey* is a secure online website which allows for the creation and publication of surveys. Each participant began the survey with a consent form. If the participant agreed to continue with the survey, they checked “yes” electronically which automatically directed them to the first page of the survey. If they checked “no,” the survey ended and thanked them for their participation. Anonymity was guaranteed because the researcher enabled a tool within *Survey Monkey* that ensures anonymity as no identifiers were attached to the respondents’ survey answers. The survey remained on the website for three weeks until all contacted parties had adequate time to respond to the survey. After completion of the survey, the investigator downloaded all data into excel spreadsheet. The survey took approximately than 15 minutes to complete.

Data Analysis.

Data were analyzed using Statistical Package for the Social Sciences (SPSS) Statistical version 16.0.1 for Windows for main effects. Statistical Analysis Software (SAS) version 9.1 was used for all interactions since SPSS did not compute the Tukey’s Post Hoc tests necessary to assess interactions within factorial ANOVA. Values were expressed as means \pm SD. Normal probability plots and Kolomogorov-Smirnov tests were used to determine whether variables were normally distributed.

Hypotheses one through eight were addressed using factorial ANOVA. Specifically, a factorial ANOVA was used to analyze the effects of gender, year in program, GPA, anticipated GPA, weekly study time, and on self-regulation and to determine whether there was a significant relationship between the variables. Factorial ANOVA was used in this study because of the ability to analyze two independent

variables across one another where one variable is paired with every value of the other variable. In this case two or more individuals were assigned to each combination of values of the independent variables (gender, year in program, GPA, anticipated GPA, and weekly study time) where there was only one dependent variable (self-regulation scale).

For this study, gender was a between-subject factor with two levels (male, female). Year in program was a between-subject factor with 4 levels (freshman, sophomore, junior, senior). GPA was a between-subject factor with 4 levels (2.0-2.49, 2.5-2.99, 3.0-3.49, 3.5-4.0). Anticipated GPA was a between-subject factor with 3 levels (2.5-2.99, 3.0-3.49, 3.5-4.0). Weekly study time was a between-subject factor with 4 levels (1-3 hours, 4-6 hours, 7-9 hours, more than 9 hours). Only main effects and two-way interactions on self-regulation were analyzed. In addition, factorial ANOVA was used to analyze the effects of GPA, gender, anticipated GPA, weekly study time, and year in program level on goal-setting, strategy implementation, and strategy monitoring. Only main effects and two-way interactions on self-regulation were analyzed for goal-setting. Significant main effects and interactions were all analyzed using the Tukey's Post Hoc test. Alpha level was set at $p < .05$ for all comparisons. Descriptive statistics were also calculated for each one of the variables in the study.

The survey was used to respond to the following hypotheses:

Research Hypothesis 1.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in overall Self-Regulation as a function of year in program.

Research Hypothesis 2.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in goal-setting as a function of year in program.

Research Hypothesis 3.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in strategy-implementation as a function of year in program.

Research Hypothesis 4.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in strategy monitoring as a function of year in program.

Research Hypothesis 5.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of gender.

Research Hypothesis 6.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of grade point average (GPA).

Research Hypothesis 7.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of anticipated grade point average (GPA) upon graduation.

Research Hypothesis 8.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of weekly study time for classes.

Research hypothesis 1 attempted to identify the general levels of self-regulation for pre-service physical education teachers. Research hypotheses 1-8 were analyzed using factorial ANOVA to determine at what levels pre-service physical education students self-regulate.

Response Rate

The investigator initially contacted via email eleven (11) instructors who had PETE students in their classroom. Of the 201 students under the degree plan of *Pedagogy All-Level Certification*, 145 responded for a response rate of 70.1%, which was considered very high (Hamilton, 2003) for an online survey. Of the 145 respondents of the survey, four of the surveys could not be used for the study due to incomplete data. Under these circumstances, students did not respond to the following: birth date, overall GPA, and two did not respond to the category of strategy-implementation which housed 15 of the total 45 questions on the survey. Although data could be used in these scenarios, the statistical analysis conducted through SPSS automatically omits entire subject lines that are deficient in a data category. Table 6 is a summary of PETE Respondents.

Table 6

Response Rate of PETE Respondents

PETE Students under Certification Program	Number of Survey Responses	Number of Usable Surveys	Response Rate
201	145	141	70.1%

CHAPTER 4

Results

In this chapter the results from the statistical analysis of the self-regulatory processes of physical education teacher education (PETE) students as measured by the Modified Five-Component Scale of Self-Regulation (FCSSR) will be reported. This chapter is organized by first discussing the descriptive characteristics of the respondents and then the data analysis based on the study's associated hypotheses.

The purpose of the study was to assess self-regulatory learning of pre-service physical education teachers in a PETE program. The investigator was interested in identifying whether the dependent category of self-regulation varied based on the independent variables of gender, year in program, current GPA, anticipated GPA upon graduation, and weekly study time. In addition, the investigator also analyzed the subcomponents (goal setting, strategy implementation, and strategy monitoring) of self-regulation as assessed by the FCSSR and their potential effects on the year in program. The FCSSR was chosen because its foundation is based on self-regulation as it pertains to social cognition, which is aligned philosophically to the study.

Analysis

Research Hypothesis 1.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in overall Self-Regulation as a function of year in program.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in overall Self-Regulation as a function of year in program.

There was no statistical significance between pre-service physical education teachers overall self-regulation and year in program as measured by the FCSSR, $F(3, 145) = .372, p = .774$. The year in program (i.e. freshman, sophomore, junior or senior) did not impact the self-regulation scores of pre-service teachers. Thus, the null hypothesis was retained. The resulting ANOVA source table and descriptive statistics may be found in Tables 7 and 8.

Table 7

Descriptive statistics of OVERALL self-regulation and year in program

Year in Program	Mean	Std. Deviation	N
Freshman	122.60	12.97	5
Sophomores	122.24	20.36	25
Juniors	118.09	18.10	65
Seniors	118.82	18.50	50

Table 8

Relationship between OVERALL self-regulation and year in program

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	375.786 ^a	3	125.262	.372	.774	.008	1.115	.122
Intercept	842767.798	1	842767.798	2500.185	.000	.947	2500.185	1.000
Year in Program	375.786	3	125.262	.372	.774	.008	1.115	.122
Error	47528.586	141	337.082					
Total	2108634.000	145						
Corrected Total	47904.372	144						

Research Hypothesis 2.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in goal-setting as a function of year in program.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in goal-setting as a function of year in program.

No statistical significance was found between pre-service physical education teachers' goal-setting capabilities of self-regulation and the year in program as measured by the FCSSR, $F(3, 147) = .527, p = .664$. This indicates that the year in program (i.e. freshman, sophomore, junior or senior) did not impact the goal-setting scores of pre-service teachers. Thus, the null hypothesis was retained, and it may be assumed that the student's year in program did not make a difference from one year to the next with

regards to one the setting of goals. The resulting ANOVA source table and descriptive statistics may be found in Tables 9 and 10.

Table 9

Descriptive statistics of goal-setting and year in program

Year in Program	Mean	Std. Deviation	N
Freshman	39.20	5.36	5
Sophomores	39.72	8.03	25
Juniors	37.65	7.43	66
Seniors	38.05	6.81	51

Table 10

Relationship between goal-setting and year in program

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	83.631 ^a	3	27.877	.527	.664	.011	1.581	.156
Intercept	87023.575	1	87023.575	1645.287	.000	.920	1645.287	1.000
Year in Program	83.631	3	27.877	.527	.664	.011	1.581	.156
Error	7563.648	143	52.893					
Total	222125.000	147						
Corrected Total	7647.279	146						

Research Hypothesis 3.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in strategy-implementation as a function of year in program.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in strategy-implementation as a function of year in program.

No statistical significance was found between pre-service physical education teachers strategy implementation of self-regulation and the year in program as measured by the FCSSR, $F(3, 146) = .141, p = .935$. The year in program (i.e. freshman, sophomore, junior or senior) did not have an impact on the strategy implementation scores of pre-service teachers. Thus, the null hypothesis was retained and thus assumed that the students' year in program did not make a difference from one year to the next

with regards to one their strategy implementation. The resulting ANOVA source table and descriptive statistics may be found in Tables 11 and 12.

Table 11

Descriptive statistics of strategy implementation and year in program

Year in Program	Mean	Std. Deviation	N
Freshman	40.20	6.98	5
Sophomores	39.72	6.25	25
Juniors	39.92	6.39	66
Seniors	39.14	7.50	50

Table 12

Relationship between strategy implementation and year in program

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	19.546 ^a	3	6.515	.141	.935	.003	.424	.075
Intercept	91862.076	1	91862.076	1994.412	.000	.934	1994.412	1.000
Year in Program	19.546	3	6.515	.141	.935	.003	.424	.075
Error	6540.481	142	46.060					
Total	235860.000	146						
Corrected Total	6560.027	145						

Research Hypothesis 4.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in strategy monitoring as a function of year in program.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in strategy monitoring as a function of year in program.

No statistical significance was found between pre-service physical education teachers' strategy monitoring of self-regulation and the year in program as measured by the FCSSR, $F(3, 146) = .657, p = .580$. This indicates that the year in program (i.e. freshman, sophomore, junior or senior) did not impact strategy monitoring scores of pre-service teachers. Thus, the null hypothesis was retained and it was assumed that the students' year in program did not make a difference from one year to the next with

regards to one their strategy monitoring. The resulting ANOVA source table and descriptive statistics may be found in Tables 13 and 14.

Table 13

Descriptive statistics of strategy monitoring and year in program

Year in Program	Mean	Std. Deviation	N
Freshman	43.20	3.11	5
Sophomores	42.80	7.90	25
Juniors	40.66	7.02	65
Seniors	41.33	7.14	51

Table 14

Relationship between strategy monitoring and year in program

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	100.498 ^a	3	33.499	.657	.580	.014	1.971	.186
Intercept	102629.276	1	102629.276	2013.260	.000	.934	2013.260	1.000
Year in Program	100.498	3	33.499	.657	.580	.014	1.971	.186
Error	7238.687	142	50.977					
Total	256965.000	146						
Corrected Total	7339.185	145						

Research Hypothesis 5.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in Self-Regulation as a function of gender.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of gender.

There was no statistical significance between pre-service physical education teachers overall self-regulation and gender as measured by the FCSSR, $F(1, 145) = .001$, $p = .986$. This indicates that self-regulatory scores were not impacted based on the gender of the participants. Thus, the null hypothesis was retained and a relationship between these two variables may not be made. The resulting ANOVA source table and descriptive statistics may be found in Tables 15 and 16.

Table 15

Descriptive statistics of OVERALL self-regulation and gender

Gender	Mean	Std. Deviation	N
Male	119.19	19.30	93
Female	119.25	16.36	52

Table 16

Relationship between OVERALL self-regulation and gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	.106 ^a	1	.106	.000	.986	.000	.000	.050
Intercept	1896223.141	1	1896223.141	5660.454	.000	.975	5660.454	1.000
Gender	.106	1	.106	.000	.986	.000	.000	.050
Error	47904.266	143	334.995					
Total	2108634.000	145						
Corrected Total	47904.372	144						

Research Hypothesis 6.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in Self-Regulation as a function of grade point average (GPA).

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of grade point average (GPA).

There was no statistical significance between pre-service physical education teachers overall self-regulation and the overall grade point average as measured by the FCSSR, $F(4, 144) = 1.453, p = .220$. This indicated that the self-regulatory scores of pre-service teachers were not impacted by higher or lower GPA's, and that GPA does not impact levels of self-regulation of the pre-service teachers. Thus, the null hypothesis was

retained. The resulting ANOVA source table and descriptive statistics may be found in Tables 17 and 18.

Table 17

Descriptive statistics of OVERALL self-regulation and overall GPA

GPA	Mean	Std. Deviation	N
2.0-2.49	122.43	20.55	16
2.5-2.99	120.94	17.07	47
3.0-3.49	114.84	19.49	56

Table 18

Relationship between OVERALL self-regulation and overall GPA

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	1922.714 ^a	4	480.679	1.453	.220	.040	5.814	.442
Intercept	324311.209	1	324311.209	980.597	.000	.876	980.597	1.000
GPA	1922.714	4	480.679	1.453	.220	.040	5.814	.442
Error	45971.258	139	330.728					
Total	2095178.000	144						
Corrected Total	47893.972	143						

Research Hypothesis 7.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in Self-Regulation as a function of anticipated grade point average (GPA) upon graduation.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of anticipated grade point average (GPA) upon graduation.

There was no statistical significance between pre-service physical education teachers overall self-regulation and their anticipated grade point average upon graduation as measured by the FCSSR, $F(2, 144) = 1.293, p = .278$. This indicated that the means of the pre-service teachers overall self-regulatory capabilities were not different from their anticipated GPA's may lie upon graduation. Thus, the null hypothesis was returned. The

resulting ANOVA source table and descriptive statistics may be found in tables 19 and 20.

Table 19

Descriptive statistics of OVERALL self-regulation and anticipated GPA

ANT	Mean	Std. Deviation	N
2.5-2.99	114.83	13.48	12
3.0-3.49	118.31	18.83	91
3.5-4.0	122.90	17.88	41

Table 20

Relationship between OVERALL self-regulation and anticipated GPA

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	856.940 ^a	2	428.470	1.293	.278	.018	2.587	.277
Intercept	1067979.406	1	1067979.406	3223.596	.000	.958	3223.596	1.000
Ant	856.940	2	428.470	1.293	.278	.018	2.587	.277
Error	46713.386	141	331.301					
Total	2098433.000	144						
Corrected Total	47570.326	143						

Research Hypothesis 8.

H₀: Pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in Self-Regulation as a function of weekly study time for classes.

H_a: Pre-service physical education teachers in a physical education teacher education (PETE) program display significant differences in Self-Regulation as a function of weekly study time for classes.

There was a statistically significant difference between pre-service physical education teachers overall self-regulation and how much they studied through their academic week as measured by the FCSSR, $F(3, 145) = 6.031, p = .001$. This indicated that overall self-regulatory capabilities were dependent on the amount of studying by the pre-service teachers. Thus, the null hypothesis was rejected and the alternative hypothesis

was accepted. The resulting ANOVA source table and descriptive statistics may be found in tables 21 and 22.

Table 21

Descriptive statistics of OVERALL self-regulation and Weekly Study time

Study Time	Mean	Std. Deviation	N
1-3 hours	110.48	18.92	31
4-6 hours	118.27	16.93	74
7-9 hours	128.73	17.58121	30
more than 9 hours	124.70	14.26	10

Table 22

Relationship between OVERALL self-regulation and Weekly Study time

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	5448.069 ^a	3	1816.023	6.031	.001	.114	18.093	.955
Intercept	1298148.436	1	1298148.436	4311.231	.000	.968	4311.231	1.000
Study Time	5448.069	3	1816.023	6.031	.001	.114	18.093	.955
Error	42456.303	141	301.109					
Total	2108634.000	145						
Corrected Total	47904.372	144						

Tukey's post-hoc comparisons indicated that there was a significant difference ($p=.001$) between pre-service teachers who studied 1-3 hours ($M=110.5$) and those who studied 7-9 hours ($M=128.70$). This indicated that the higher the amount of study time, the higher the total self-regulation scores, as self-reported by this response group. In addition, there was also statistical significance ($p=.036$) between those pre-service teachers who studied 4-6 hours ($M=118.27$) and those who studied 7-9 hours ($M=128.70$). Again, a statistical relationship showing increased study time and increased self-regulation scores was shown. Comparisons between the other groups were not significant at $p < .05$. These data can be found in Figure 1.

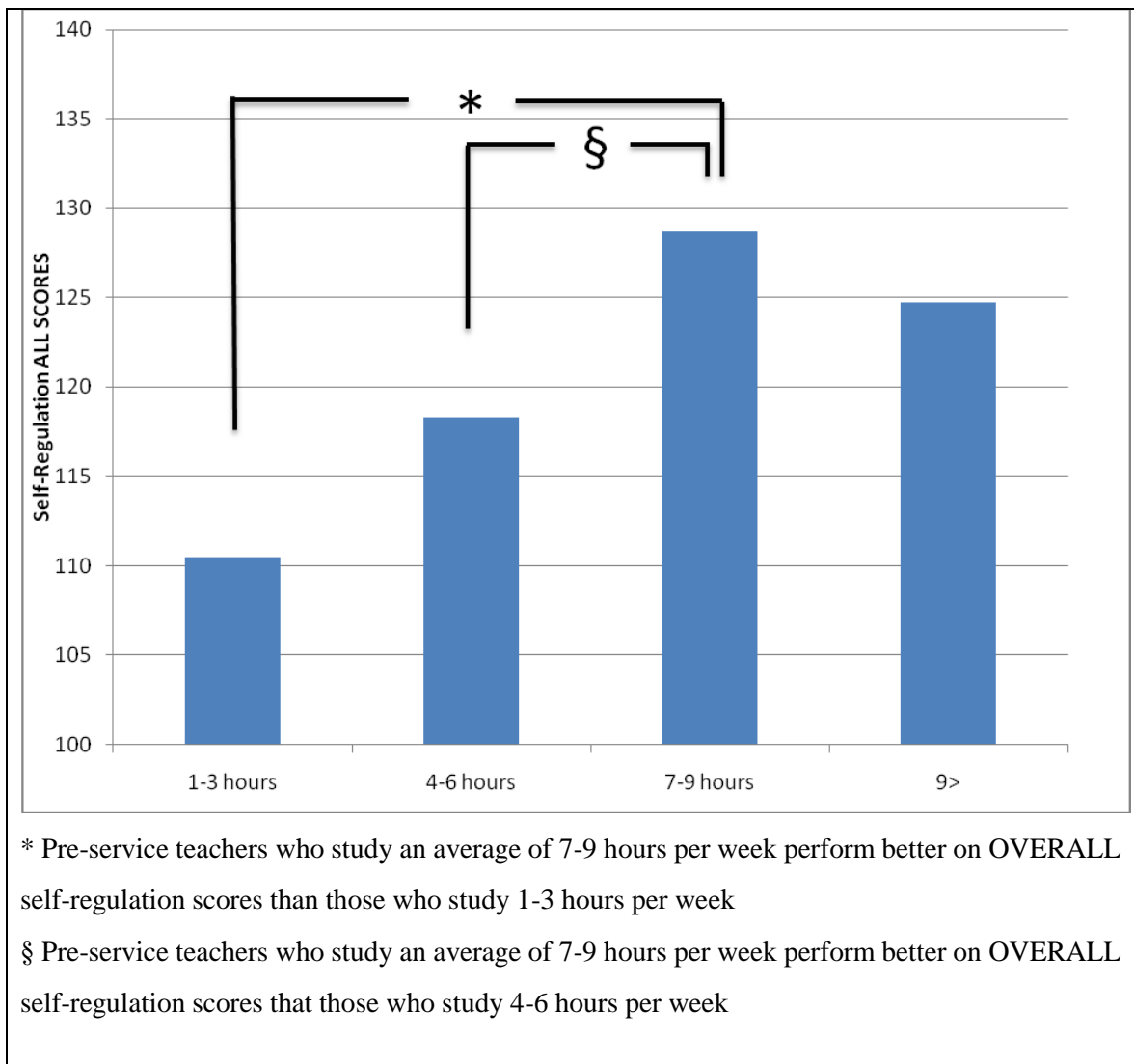


Figure 1. Overall Self-Regulation Interactions (ALLSCALE*Weekly Study Time)

Additional Findings

In addition to statistically significant findings between overall self-regulation and weekly study time, it is important to note additional findings relative to the study when analyzing two-way interactions. While conducting factorial ANOVA's on the previous hypotheses, the investigator processed two-way interactions in conjunction with the main-effects while using self-regulation, and its subscales of goal-setting, strategy implementation and strategy monitoring as the dependent variables.

A significant difference was found in the interaction between year in program (i.e. freshman, sophomore, junior, senior) and GPA of the participants ($F=2.52, p = .019$) when measured against overall self-regulation. Results can be seen in Table 23.

Table 23

*Overall Self-Regulation (Year in Program*GPA)*

	Type III Sum of Squares	Df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power
Year in Program*GPA	5456.437	7	779.491	2.52	.019	14.291	.809

Tukey's post-hoc comparisons indicated that there was a significant difference ($p=.044$) between sophomore pre-service teachers with a 2.0-2.49 GPA ($M=139$) and junior pre-service teachers with a GPA of 3.0-3.49 ($M=108$). This indicates that juniors with a higher GPA scored higher in self-regulation than sophomores with a lower GPA. Comparisons between other groups were not significant at $p < .05$.

These data can be found in Figure 2.

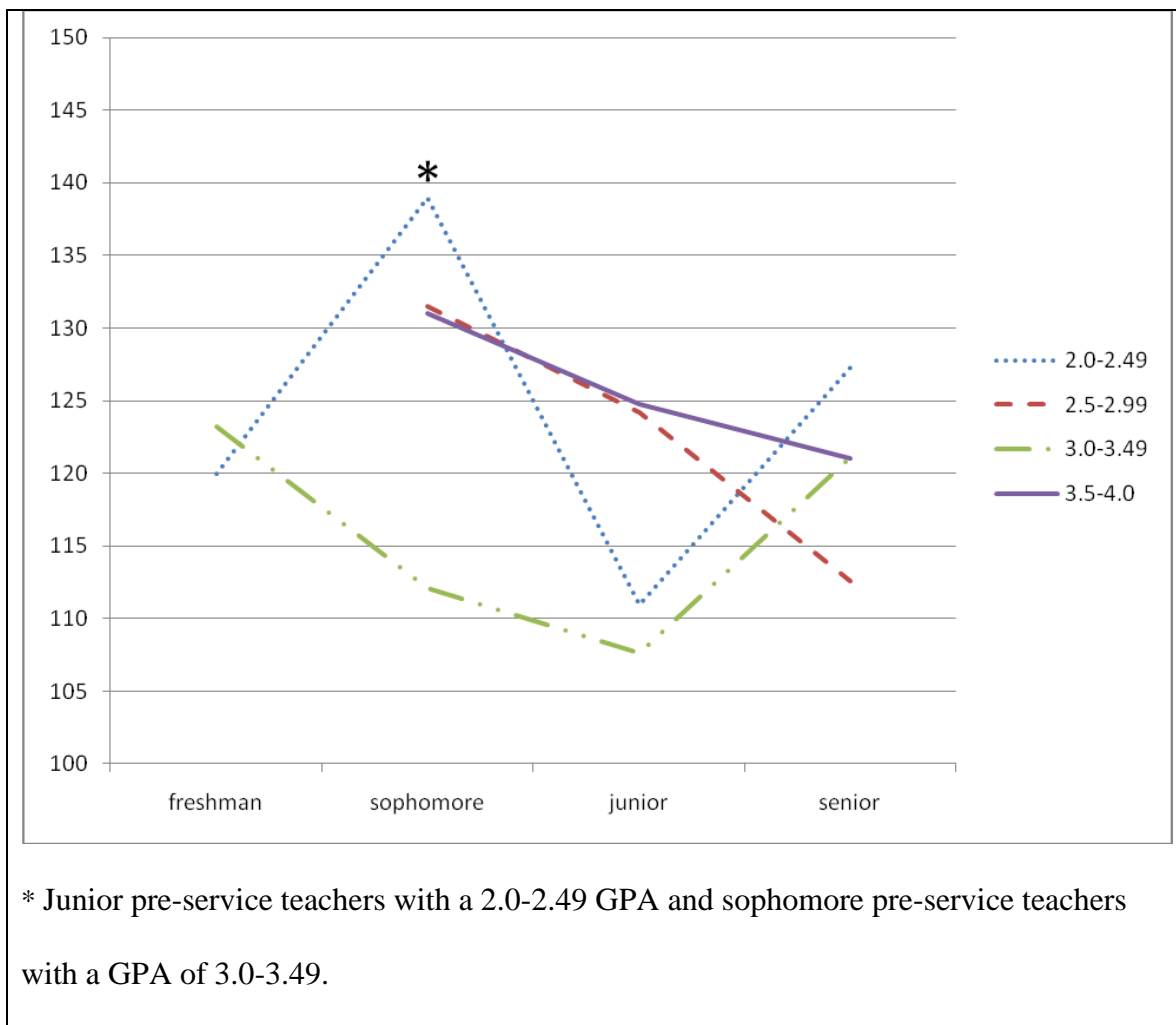


Figure 2. Overall Self-Regulation Interactions (Year in Program*GPA)

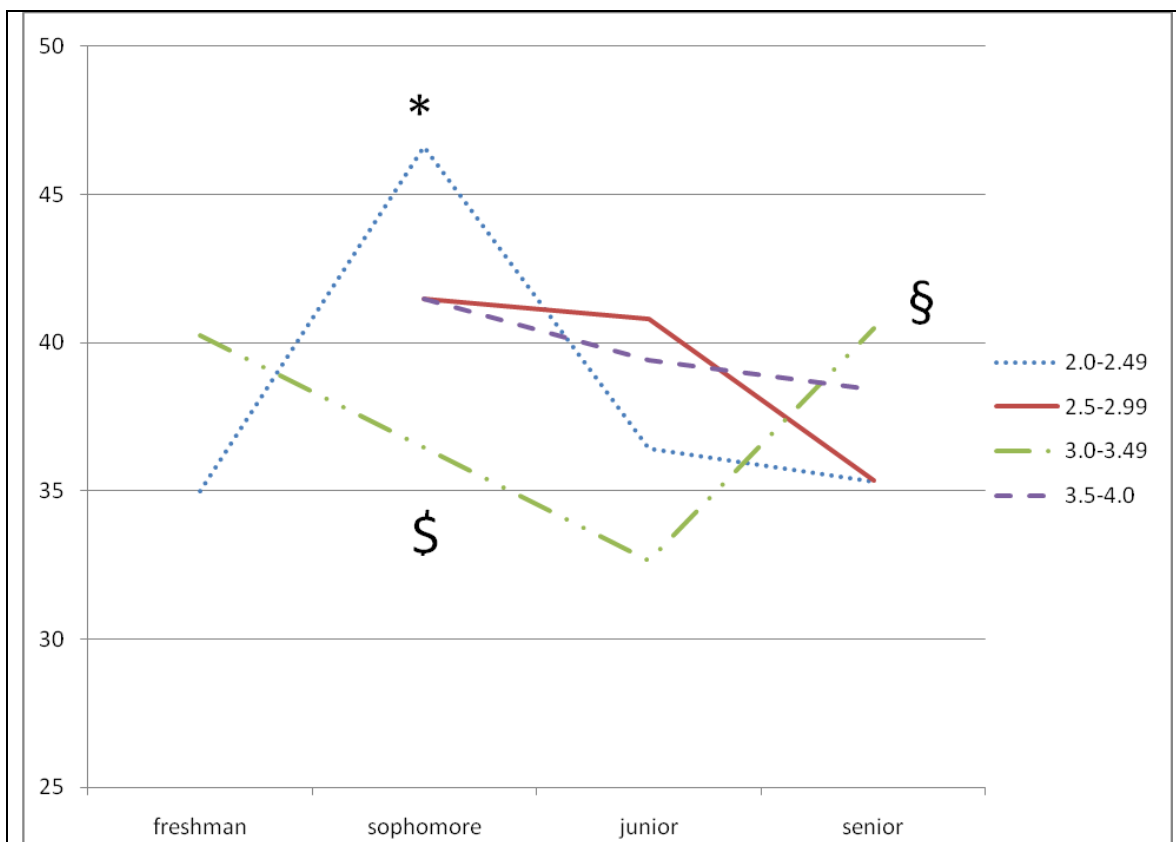
Since an interaction was discovered using overall self-regulation as the dependent variable, further analyses were conducted on the dependent variable scores of goal-setting, strategy implementation and strategy monitoring to see if significant interactions existed as well. The investigator found statistical significance ($F=3.57, p=.002$) between year in program and overall GPA in goal-setting, but NOT in strategy implementation or strategy monitoring. Results can be seen in Table 24.

Table 24

*Goal Setting (Year in Program*GPA)*

	Type III Sum of Squares	Df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power
Year in Program*GPA	1164.780	7	166.39	3.57	.002	20.925	.943

Tukey's post-hoc comparisons indicated that there was a significant difference ($p=.007$) between sophomores with a 2.0-2.49 ($M=46.6$) and juniors with a GPA of 3.0-3.49 ($M=32.66$). This indicates that juniors with a higher GPA scored lower in self-regulation than sophomores with a lower GPA. Statistical significance ($p=.012$) was also found between juniors ($M=32.64$) with a 3.0-3.49 and juniors ($M=40.85$) with a GPA of 2.5-2.99. This indicates that juniors scored higher in self-regulation when they have a lower GPA. Finally, statistical significance ($p=.038$) was found between seniors with a GPA of 3.0-3.49 ($M=40.47$) and juniors with the same GPA ($M=32.66$). This indicates that a seniors' score higher in self-regulation with juniors with the same GPA. Comparisons between the other groups were not significant at $p < .05$. These data can be seen in Figure 3.



* Sophomore pre-service teachers with a 2.0-2.49 score higher in goal-setting than juniors with a 3.0-3.49 GPA

\$ Junior pre-service teachers with a 3.0-3.49 score lower in goal-setting than juniors with a GPA of 2.5-2.99 GPA

§ Senior pre-service teachers a 3.0-3.49 scored higher in goal-setting than juniors with the same GPA

Figure 3. Goal-Setting Interactions (Year in Program*GPA)

Discussion on these analyses, as well as possible future research, will continue in chapter five. This will include implications for pre-service physical education teachers, as well as for PETE programs.

CHAPTER 5

Discussions and Recommendations

This study examined the self-regulatory learning of pre-service physical education teachers enrolled in a physical education teacher education (PETE) program. This study also identified whether the dependent category of self-regulation varied based on the independent variables of gender, year in program level, current GPA, anticipated GPA upon graduation, and overall weekly study time. In addition, this study examined the subcomponents of self-regulation: goal-setting, strategy implementation, and strategy monitoring.

Research Hypothesis 1.

Research hypothesis one stated that pre-service physical education teachers in a physical education teacher education (PETE) program display no differences in overall self-regulation as a function of year in program (freshman, sophomore, junior or senior). This null hypothesis was accepted as no statistical difference was found.

This finding suggests that overall self-regulation, as measured by the FCSSR, did not change significantly over the course of a student's academic career in the PETE program. It is important to state that most theories in self-regulation do not see self-regulation as merely a capacity or stage of development but involves "temporally delimited processes, strategies, or responses that students must initiate and regulate proactively" (Zimmerman & Schunk, 2001, pg. 6). Self-regulation occurs as a strategic action to a stimulus, or as social-cognitive theorists believes, a goal. Simply assessing a student's self-regulation without a stimulus of any kind may have resulted in this non-significant finding.

Even though no differences were found, the researcher was interested in identifying self-regulation baseline scores of each level of year in program. Unfortunately, identifying self-regulation in a snapshot without attempting to identify what parts of this dynamic process may have changed over the course of time may have led to non-significance in the finding. Possibly, a more accurate way to identify changes in self-regulation through a PETE student's academic career would be to add a self-regulation pedagogical intervention or learning module and identify how and why self-regulation changed as a result of the intervention (i.e. a self-regulation lesson on volition control while teaching physical education). By using a treatment group, the social-cognitive core concepts of self-efficacy, outcome expectations, or goals could be assessed.

Research Hypothesis 2, 3, and 4.

Research hypotheses two, three, and four stated that pre-service physical education teachers in a PETE program display no differences in goal-setting, strategy implementation and strategy monitoring, respectively, as a function of year in program. As a result, these null hypotheses were accepted as no significant differences were found in any of these hypotheses.

These findings suggest that overall goal-setting, strategy implementation and strategy monitoring as measured by the FCSSR did not significantly change over the course of the PETE student's academic career. Schunk and Zimmerman (2001, pg. 19) argued, "students' efforts to self-regulate during learning are not determined merely by personal processes, such as cognition or affect; these processes are assumed to be influenced by environmental and behavioral events in a reciprocal fashion." Thus, to

accurately determine these subcomponents of social-cognitive self-regulation, a treatment action or intervention should take place in the assessment process. Simply identifying self-regulation without manipulating either the environment or behavioral aspects of learning may be a futile attempt in identifying changes in self-regulation.

Research Hypothesis 5.

Research hypothesis five states that pre-service physical education teachers in a PETE program display no differences in self-regulation as a function of gender. The null hypothesis was accepted as no statistical difference was found.

This finding is contrary to past research in self-regulation, which indicates gender did have an impact on self-regulation. In many cases, gender did in fact predict self-regulation (Anderson et al., 2006; Coleman et al., 2006; Raffaelli, Crockett, & Shen, 2005). This prediction of self-regulation is common, especially as there is an increase in age. Since sense of self and gender schemas develop over time, so does self-efficacy in self-esteem, which may drive self-regulation. Self-regulatory differences tend to appear because boys rate themselves highly in things like sports, whereas girls tend to rate themselves highly in reading and literature (Cole et al., 2001; Harter, 1999; Herbert & Stipek, 2005; Wigfield et al., 2006). As a result of increased perception of efficacy in academics, an increase in self-efficacy may exist. Girls may feel better about their abilities to self-regulate to use appropriate learning strategies. Learners who have this positive self-perception of their academic ability are more likely to succeed academically which begets success in academics. Thus, this cycle continues.

Research Hypothesis 6.

Research hypothesis six states that pre-service physical education teachers in PETE program display no differences in self-regulation as a function of overall grade point average. This null hypothesis was accepted as no statistical difference was found.

This finding suggests that self-regulation scores are not affected by high or low GPA of pre-service students. Interestingly, self-regulation scores were higher for those with a 2.0-2.49 GPA ($M=122$) compared to those with a higher GPA of 3.0-3.49 ($M = 114$). This could be attributed to students with lower GPA's overtly thinking about their own metacognition while involved with a learning process instead displaying procedural automaticity like that of students with higher GPA's. Thus, it could be assumed that there is a leveling off or state of automaticity that takes place as students attain higher GPA's. Those with higher GPA's could assume to have a level of self-regulatory saturation that does not require covert thought of the process itself.

Research Hypothesis 7.

Research hypothesis seven states that pre-service physical education teachers in a PETE program display no differences in self-regulation as a function of anticipated grade point average upon graduation. The null hypothesis was accepted as no statistical difference was found.

This finding indicates that there are no observed differences between what students anticipate their GPA's to be upon graduation with their current self-regulatory capabilities as measured by the FCSSR. Therefore in this study, anticipating a high or low GPA upon graduation was not indicative of someone who self-regulated. Self-regulation theorists acknowledge that self-regulation is better utilized within the

constructs of a goal actually taking place instead of theorizing about that goal (Zimmerman, 2000).

Research Hypothesis 8.

Research hypothesis eight states that pre-service physical education teachers in a PETE program display no differences in self-regulation as a function of weekly study time for year in program. There were significant differences between these two variables thus rejecting the null hypothesis and accepting the alternative hypothesis.

This finding suggests that there was an optimal amount of weekly study time with regards to self-regulation. When analyzing the interactions of this main effect, there was a significant difference between 1-3 hours of study time in comparison to 7-9 hours of study time. In addition, there was also statistical significance between 4-6 hours of study time to 7-9 hours of study time as well. Interestingly, there was no statistical significance when studying more than 9 hours with regards to overall self-regulation. Thus, it could be assumed that those who are self-regulated recognize the amount of time necessary to attain their goals. These results potentially demonstrate that pre-service teachers who do not score highly in self-regulation either may not study enough (1-3 hours per week) or study too much (more than 9 hours per week) because they are not able to self-regulate their time in either case. In both cases (1-3 hours and more than 9 hours) the students may not use self-regulation to attain their academic goal because of misused time-on-task when they are studying.

In addition to finding statistical differences with regards to self-regulation as a function of weekly study time, significant interactions were found between year in program and GPA when measured against overall self-regulation AND the subset of

goal-setting. These additional findings suggest that pre-service teacher self-regulation becomes more autonomous as a result of their year in program level (freshman, sophomore, junior, senior). According to social cognitive theorists (Boekaerts et al., 2000), the pre-service teacher has attained a certain level of self-efficacy in the self-regulatory capability in that domain. Common with each result, it generally appears that the lower GPA or year in program standing indicated higher scores in self-regulation as indicated by the FCSSR. Again, the investigator assumes there is a plateau effect that occurs with regards to self-regulation in which students become more automated about their self-regulation strategies when attaining academic goals. It would then be assumed that, once a certain level of self-regulation has been attained, pre-service teachers' self-regulated process, strategies or responses become more automatic in nature. Therefore, it is proposed that self-regulation is best taught to students when they are in their first two years of college. It appears that this optimal time in the pre-service teachers' education process offers up a more malleable student to learn and apply self-regulation strategies.

Zimmerman and Schunk (2001) reported when Self-Regulated Learning (SRL) is not utilized as much, as in the case with upper-class students, their failure to use it may be attributed to three potential factors: (a) belief that a known self-regulation process will work in a learning context, (b) belief that they will not execute successfully an otherwise effective self-regulation response, or, (c) belief that the outcome may not be desirable whereas the effort to self-regulate is not utilized. In two of these potential factors, the role or their own perception of self-regulation is important to determine as is the importance to determine motivation, which according to social-cognitive theorist, helps drive actually attempting to attain the goal itself.

Limitations

A limitation in this study was the lack of sufficient power to find differences between groups. To increase statistical power, researchers can increase the difference between the means, decrease standard deviation, increase the number of participants, and increase alpha levels. To ensure adequate power for this study, a minimum number of 306 participants' was necessary, but only 141 responded to the actual survey. As a result, more participants were necessary to ensure the attainment of appropriate power.

Another limitation to the study was the high reported standard deviations. In the Maclellan and Soden study (2006), a repeated measures design where the same subjects were tested pre and post-intervention was used. In this study, a repeated measures design was not utilized, which resulted in lowering overall power. Repeated measures design are more powerful than this study's design because it utilizes between subject designs and the differences between the subjects are not included in the ANOVA calculations. Since there were different subjects in the groups, this resulted in larger SD than reported by Maclellan and Soden. For example, for strategy implementation, Maclellan and Soden reported a mean change pre and post-intervention of .99 with standard deviation of .48. In this study, the comparison of freshman to seniors resulted in a similar mean difference of 1.06, but it had a standard deviation of 7.23. As a result, this study did not have enough statistical power from the onset. More participants in this study were necessary to increase statistical power.

Another limitation in this study was with the assessment strategy utilized to test the dynamic nature of self-regulation in a non-dynamic setting. Self regulation is seen as a number of integrated processes that include goal-setting, strategy implementation, and

strategy monitoring, which is difficult to assess if there is not an actual goal by which the student is strategizing against. Thus, it is understood that self-regulation is not an entity that can be described or assessed based on a snapshot of one's own self-regulation as self-reported in a questionnaire. Instead, it should be assessed as a function of actual attainment of a goal, through a self-regulation intervention program, or something of the like. To accurately assess self-regulation takes the work of assessment as it is happening, not before or after the fact.

Sampling is also a limitation in this study. It would be recommended to utilize other pre-service teachers across a region or even within the country instead of taking a sample from one institution. This could possibly give a better indication of pre-service teacher's self-regulation that may be more generalizable.

A final limitation was the actual use of self-report to identify levels of self-regulation. Zeidner (Boekaerts et al., 2000) recommended utilizing more observational and performance measurements relevant to self-regulation processes and outcomes to be utilized (i.e. think alouds). As a result of self-regulations dynamic nature, utilizing self-report may not be the best method for future studies.

Recommendations for Future Research

Future research utilizing PETE pre-service students should be conducted through the use of an intervention module, or treatment style methodology. Consistent with theories of self-regulated learning, future studies of pre-service teachers in PETE programs may want to look more specifically at what motivates pre-service students to self-regulate their own learning. PETE researchers may want to look at specific

subcomponents such as self-efficacy, outcome expectations, and goals with regards to teaching and/or overall self-regulation as they are occurring as a result of stimulus.

Secondly, research on self-regulation in pre-service teachers may focus on other critical components of self-regulation that deal with key processes that are commonly used when pre-service teachers self-regulate their learning. Research could assess the processes of self-observation, self-judgment, and self-reactions. In addition, how social and environmental factors impact the use of self-regulation as observed through modeling of teaching physical education might be investigated.

Additional research could assess the self-awareness of pre-service students and their abilities to determine when and where self-regulation is necessary. Such an investigation could be conducted through self-observation style assessment pieces (i.e. videotaping). Finally, it might be interesting to investigate how self-regulation is actually acquired by pre-service teachers. It would be interesting to describe the developmental competence of pre-service teachers in terms of the four levels of *observation*, *emulation*, *self-control*, and *self-regulation* as described by social-cognitive theorists (Zimmerman, 2000) since social-cognitive theorists stress the importance of the environment on the self-regulatory process.

Conclusion

The process by which pre-service teachers self-regulate is important in the understanding of how they are to be taught. Practically speaking, if it is understood that self-regulation in pre-service teachers in a PETE program reaches a self-regulation threshold as sophomores in college, understanding this timeline may yield an important time to integrate additional understandings in the self-regulatory processes that are occur.

There may be a key time in their academic development when the process of self-regulation is taught so they may better understand their own learning.

Appendices

Appendix A

Survey

Name: _____ Age: _____

Check One: Male () Female ()

Class level (check one): Freshman () Sophomore () Junior () Senior ()

Ethnic Background (check one): African-American () Asian-American ()
Caucasian () Hispanic () Other ()

1. Current GPA _____
2. Anticipated GPA upon graduation _____
3. ACT and/or SAT scores _____
4. On average, how many hours in a week do you prepare for your classes? _____
5. What courses are you taking this semester?

	Name of Course you are taking	Expecting grade			Name of Course you are taking	Expecting grade
1				4		
2				5		
3				6		

Modified Five-Component Scale of Self-Regulation (FCSSR)
(Maclellan & Soden, 2006)

GOAL SETTING

Some students set goals for themselves when doing their academic work. How often do *you* set goals to perform your academic work? Use this scale to show your responses:

never	sometimes	frequently	all the time
1	2	3	4

		Scale value point
1	When doing my academic work, I always set goals to guide in my efforts	
2	I check with others (peers, parents, tutors) that the goals I set for myself are realistic	
3	I set clear goals that I can describe without difficulty	
4	I set goals that go beyond what I have already achieved	
5	I set goals that present me with a challenge	
6	I check with others that the goals I set for myself are clear	
7	I give myself plenty of time to achieve the goals I set for myself	
8	I set goals that I think I have a good chance of achieving	
9	I check with others that I give myself enough time to work on my goals	
10	I am able to clearly distinguish my academic goals from one-another	
11	I check with others that my goals involve objectives that I have not yet attained	
12	I make sure that the number of goals I set for myself is manageable	
13	I organize my goals so that attaining one makes it easy to attain another	
14	I set a definite deadline (date, time) for reaching each goal	
15	I can't make sense from one day to the next of my goals	

STRATEGY IMPLEMENTATION

Some students use the following strategies to perform their academic work, while others prefer not to use strategies such as these. How often do *you* use the strategies listed to perform your academic work? Use this scale to show your responses:

never	sometimes	frequently	all the time
1	2	3	4

		Scale value point
16	I get tutors to help me when I get stuck with academic work	
17	I get other students to help me when I get stuck with academic work	
18	I get other adults to help me when I get stuck with academic work	
19	I motivate myself to do academic work when I find the material difficult	
20	I motivate myself to do academic work when I find the material boring	
21	I motivate myself to do academic work when I are tired or fatigued	
22	I motivate myself to do academic work when there are other interesting things to do	
23	I take notes during class	
24	I use the library to get information for assignments	
25	I organize my academic work	
26	I rehearse to remember information presented in class or textbooks	
27	I continue with my academic work when I find the material very hard	
28	I continue with my academic work when I find the material very boring	
29	I continue with my academic work when I are tired or fatigued	
30	I continue with my academic work when there are other interesting things to do	

STRATEGY MONITORING


When using a strategy such as note taking or underlining to do academic work, how often do you do the following things? Use this scale to show your responses:

never	sometimes	frequently	all the time
1	2	3	4

		Scale value point
31	I check to see if I am performing the strategy in the way it's supposed to be carried out	
32	I have alternative strategies available in case the one I use does not work	
33	I compare my performance with that of others to see if I am performing the strategy in the way it's supposed to be carried out	
34	I check my work to see if the strategy is having its desired effect	
35	I compare the strategy to other methods to see which is more effective	
36	I keep records of my performance so I can see how much progress I am making	
37	I try out problems in textbooks to see how well I have mastered the material	
38	I take old tests to see how well I know the material	
39	I adjust my behavior as necessary to better use the strategy	
40	I switch to a more effective strategy when the one I are using is not working	
41	I review my answers on a test to see what mistakes I have made, if any	
42	I look for what I did wrong when I find I have not succeeded in mastering the material	
43	I take action to rectify the reason for whatever mistakes I have identified	
44	I check to make sure I have rectified the mistake	
45	I reward myself for correcting the mistake	

Appendix B University of Texas IRB

October 28, 2008



Office of Research Administration
Box 19188
202 E. Border St., Suite 201
Arlington, Texas
76019-0188
T 817.272.3723
F 817.272.1111
<http://www.uta.edu/research>
Expertise at UT Arlington
<http://www.uta.edu/expertise>

Terry Dale Olson, PhD
Kinesiology
The University of Texas at Arlington
Box 19259

RE: Expedited Approval of Protocol

TITLE: *Assessment of Preservice Physical Education Teacher Education (PETE) Students Self-Regulation: Implications for Teacher Foundational Enhancement.*

IRB No.: 2009.954s

The University of Texas Arlington Institutional Review Board (UTA IRB) has determined that this research is eligible for expedited review in accordance with Title 45 CFR 46.110(a)-(b)(1), 63 FR 60364 and 63 FR 60353, category (6)(7).

The IRB Chairman (or designee) approved the protocol effective October 28, 2008. IRB approval for the research shall continue until October 27, 2009. In order for the research to continue beyond the first year, Continuation Review must be completed within the month preceding the date of expiration indicated above. A reminder notice will be forwarded to the attention of the Principal Investigator (PI) at that time.

The approved subject sample size is 200

Important Note: The IRB approved and stamped informed consent document (ICD), showing the approval and expiration date of the article must be used when prospectively enrolling volunteer participants into the study. The use of a copy of any consent form on which the IRB-stamped approval and expiration dates are not visible, or are replaced by typescript or handwriting is prohibited. The signed consent forms must be securely maintained on the UT Arlington campus for the duration of the study plus three years. The complete study record is subject to inspection and/or audit during this time period by entities including but not limited to the UT Arlington IRB, Regulatory Services staff, OHRP and by study sponsors (if the study is funded).

Please be advised that as the principal investigator, you are required to report local adverse (unanticipated) events to this office within 24 hours. In addition, pursuant to Title 45 CFR 46.103(b) (4) (iii), investigators are required to, "promptly report to the IRB any proposed changes in the research activity, and to ensure that such changes in approved research, during the period for which IRB approval has already been given, are **not initiated without prior IRB review and approval** except when necessary to eliminate apparent immediate hazards to the subject."

All investigators and key personnel identified in the protocol must have documented *Human Subjects Training* or *CITI Training* on file with this office.

If applicable, approval by the appropriate authority at a collaborating facility is required prior to subject enrollment. If the collaborating facility is *engaged in the research*, an OHRP approved Federalwide Assurance (FWA) may be required for the facility (prior to their participation in research-related activities). To determine whether the collaborating facility is engaged in research, go to:
<http://www.hhs.gov/ohrp/humansubjects/assurance/engage.htm>

The UT Arlington Office of Research Administration Regulatory Services appreciates your continuing commitment to the protection of human research subjects. Should you have questions or require further assistance, please contact Philip Oilepo by calling (817) 272-3723.

Sincerely,

Patricia Turpin

Digitally signed by Patricia Turpin
 DN: cn=The University of Texas System, ou=The University
 of Texas at Arlington CA, ou=www.orelsgu.com/
 repository/CPS/Source, byRef=LM<D099, cn=Patricia
 Turpin, email=pturpin@uta.edu,
 Date: 2008.10.29 05:03:31 -0500

Patricia G. Turpin, PhD, RN, NEA-BC
 Associate Clinical Professor
 UT Arlington IRB Chair

Encl (if applicable):
 Consent Form(s)
 Questionnaire(s) or Survey(s)
 Project Summary

Appendix C University of New Mexico IRB



THE UNIVERSITY of
NEW MEXICO

Main Campus Institutional Review Board

Human Research Protections Office

1717 Roma NE, MSC05 3180

1 University of New Mexico~Albuquerque, NM 87131-0001

<http://hsc.unm.edu/som/research/HRRC/>

17-Mar-2009

Responsible Faculty: Gloria Napper-Owen

Investigator: Terry Olsen

Dept/College: Health Exercise & Sports Science

SUBJECT: IRB Approval of Research - Modification

Protocol #: 08-523

Project Title: Assessment of Preservice Physical Education Teacher Education (PETE) Students Self-Regulation: Implications for Teacher Foundational Enhancement

Type of Review: Expedited Review

Approval Date: 17-Mar-2009

Expiration Date: 16-Mar-2010

The Main Campus Institutional Review Board has reviewed and approved the above referenced protocol. It has been approved based on the review of the following:

1. IRB Application, revised, received 011309
2. Informed Consent Statement (online) v120408
3. Online Survey

Consent Decision:

Signature waived; requires written statement about research

When consent is required, it is the responsibility of the Principal Investigator (PI) to ensure that ethical and legal informed consent has been obtained from all research participants. A date stamped original of the approved consent form(s) is attached, and copies should be used for consenting participants during the above noted approval period.

As the principal investigator of this study, you assume the following responsibilities:

Renewal: Unless granted exemption, your protocol must be re-approved each year in order to continue the research. You must submit a Progress Report no later than 30 days prior to the expiration date noted above.

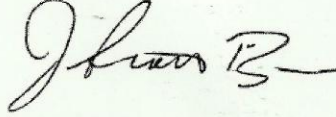
Adverse Events: Any adverse events or reactions must be reported to the IRB immediately.

Modifications: Any changes to the protocol, such as procedures, consent/assent forms, addition of subjects, or study design must be submitted to the IRB for review and approval.

Completion: When the study is concluded and all data has been de-identified (with no link to identifiers), submit a Final Report Form to close your study.

Please reference the protocol number and study title in all documents and correspondence related to this protocol.

Sincerely,



J. Scott Tonigan, PhD
Chair
Main Campus IRB

* Under the provisions of this institution's Federal Wide Assurance (FWA00004690), the Main Campus IRB has determined that this proposal provides adequate safeguards for protecting the rights and welfare of the subjects involved in the study and is in compliance with HHS Regulations (45 CFR 46).

Appendix D Informed Consent

SELF-REGULATION STUDY CONSENT FORM

CONSENT TO PARTICIPATE IN RESEARCH

- **INTRODUCTION**

You are invited to participate in a research study conducted by Terry Dale Olson, from the Department of Health, Exercise and Sport Sciences at the University of New Mexico. All collected data will be used as a study for my dissertation. You were identified as a possible volunteer in the study because you are enrolled as an undergraduate in the Department of Kinesiology at the University of Texas Arlington in the field of Physical Education.

- **PURPOSE OF THE STUDY**

The purpose of this study is to assess the self-regulatory process, or the steps you take to attain your personal goals, of pre-service teachers enrolled in a physical education teacher education (PETE) program.

- **PROCEDURES AND ACTIVITIES**

After indicating consent, you will gain access to the questionnaire which contains 45 questions pertaining to your own self-regulation, or self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals. Within the 45 questions, 15 will ask about your own personal goal setting, 15 will ask about your strategy implementation, and 15 will ask about your own strategy monitoring. This survey will then be complete. The survey should take no more than 15 minutes from beginning to end and will be taken only one time.

Based on taking this questionnaire, there are no procedures within the study that are experimental or greater than normal risks. In addition, you will not receive payment or any other incentives for your participation in this study.

- **POTENTIAL RISKS AND DISCOMFORTS**

The investigator anticipates minimal foreseeable risks, discomforts or any other inconveniences as a result in participating in this questionnaire. If they should occur, you are asked to contact the primary investigator and/or his mentor as listed below. Due to the nature of the survey, there is no need of physical participation. Additionally, the investigator does not anticipate any social, psychological, legal, economic or other risks to you.

- **POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY**

It is to be understood that you will unlikely benefit from any immediate results. Although immediate benefits are unlikely, personal insight into your self-regulation, or your ability to goal set, self-observe, and self-evaluate your own learning as a task is being accomplished could be interesting to you.

In addition, all data collected in this study could potentially influence the way pre-service teachers are taught in PETE programs throughout the country. By understanding the way our pre-service

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EXPIRES: 3/16/10

The University of New Mexico Institutional Review Board

teachers self-regulate their learning, university programs could infuse the pre-service teachers daily cognitive abilities into the daily content and pedagogical knowledge they are learning. Thus, university programs who teach these pre-service teachers could teach them how to use their self-regulatory capabilities when involved with new teaching scenarios where they may be inexperienced.

- **CONFIDENTIALITY**

Any information obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Upon gathering all questionnaires, the primary researcher will then code each through a numbering system of 1-200. Therefore, your name will never be seen as the data is analyzed. Other than the principal researcher, there will be NO OTHER supporting personnel interacting with the participants of this dissertation study. The principal researcher will import collected data into SPSS version 16.0 for significant analysis. Your responses will be collected with anonymity unless you request additional information from the investigator regarding your answers. Data analyses will be discussed with the principal researcher's dissertation chairperson for feedback and further direction for appropriate survey analysis. Upon completion of the data analysis for this study, all original data from this dissertation study will be secured for five years in a confidential cabinet in the principal investigator's office.

- **PARTICIPATION AND WITHDRAWAL**

You can choose whether to participate in this study or not. If you volunteer to participate, you may withdraw at any time without penalty or loss of benefits to which you might otherwise be entitled. You may also refuse to answer any questions you do not want to answer and still remain in the study. In an event that you choose not to participate or answer any questions, your grade or standing within the institution will not be compromised or altered.

- **IDENTIFICATION OF INVESTIGATORS AND REVIEW BOARD**

If you have any questions or concerns about the research, please feel free to contact: **Terry Olson at (817) 807-7043 and/or Dr. Gloria Napper-Owen at (505) 277-2783**. We can also be reached at any time at **4640 Allegheny Ct. NW, Albuquerque NM, 87114, or at University of New Mexico, Johnson Center Room 1161, respectively**. If you have other concerns or complaints, contact the Institutional Review Board at the University of New Mexico, 1717 Roma NE, Room 205, Albuquerque, NM 87131, (505) 277-2257, or toll free at 1-866-844-9018.

[No signature line required. Participants will check "yes" on the internet to consent and proceed. They can choose "no" if they do not want to participate—see hardcopy of consent form as per Survey Monkey.]

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