4-23-2014

Factors That Influence Cognitive Engagement and Academic Success of Pre-Licensure Baccalaureate Millennial Nursing Students

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FACTORS THAT INFLUENCE COGNITIVE ENGAGEMENT AND ACADEMIC SUCCESS OF PRE-LICENSURE BACCALAUREATE MILLENNIAL NURSING STUDENTS

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Philosophy

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May 2014

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Title: Factors That Influence Cognitive Engagement and Academic Success of Pre-Licensure Baccalaureate Millennial Nursing Students

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Pre-licensure baccalaureate nursing programs are facing the demand to retain and graduate students with the skills needed for the complex health care environment. Nursing faculty are challenged to identify the most appropriate student-centered strategies for promoting cognitive engagement in learning and academic success of the current generation of nursing students. To know how to adequately equip pre-licensure baccalaureate millennial nursing students with life-long learning skills, nursing faculty should have an understanding of the interrelationship between self-regulated approaches to learning, cognitive engagement, and successful academic outcomes.

This study examined factors that influence cognitive engagement in learning and academic success of senior-level pre-licensure baccalaureate millennial nursing students. This study utilized a quantitative descriptive correlational design. A convenience sample of 65 pre-licensure baccalaureate millennial nursing students enrolled in a specific nursing theory course at a large state university in western Pennsylvania was used. The Motivated Strategies for Learning Questionnaire (MSLQ) was used to assess the motivational construct of self-efficacy and the use of cognitive self-regulated learning strategies amongst this cohort of learners.

This study revealed senior-level pre-licensure baccalaureate millennial nursing students use all three cognitive self-regulated learning strategies (e.g., rehearsal, elaboration, organization) to understand content in a nursing theory course. Further statistical analysis

indicated an increase in study time was associated with the use of both basic (e.g., rehearsal) and complex (e.g., elaboration and organization) cognitive self-regulated approaches to learning. Whereas increased self-efficacy beliefs and high grade point averages were associated with the use of select complex cognitive self-regulated learning strategies.

The results of this study offer nurse educators insight into the way senior-level pre-licensure baccalaureate millennial nursing students perceive, interact, and respond to the environment in which their learning occurs. The implications of this study may be used by nurse educators to aid in the planning and implementation of curriculum and instructional methods that encourage the development of higher-level competency based decision making skills. The results of this study also support the need for future research in this area.

ACKNOWLEDGEMENTS

First, I would like to thank my dissertation committee for their guidance and support throughout this long journey. Dr. Teresa Shellenbarger, thank you for being my dissertation chair. I cannot put into words my sincere gratitude for you endless words of wisdom, encouragement, and inspiration. You always made me a priority, even while traveling! I never would have reached my goals without you. Dr. Michele Crytzer, thank you for your thoughtful reviews of my work. Dr. Christoph Maier, thank you for sharing your statistical expertise. I am tremendously grateful for my committee's dedication to seeing me succeed.

I would also like to thank my cohort. The friendships and memories made in Johnson Hall room 208 will never be forgotten. Thank you for the many laughs and group therapy sessions. Many thanks to my dear friend Anna for your unwavering support. We had many late night "scholarly" conversations. You kept me grounded as I "picked my piece of pie" from the bakery. Remain focused and stick to your time line. The finish line is in sight, keep writing!

Lastly, I would like to thank my family. Dan, thank you for your support and repeated assurance that I would make it to this moment. Logan and Caleigh, thank you for your patience, selflessness, and understanding while I completed this degree. To my parents Russ and Kathy, thank you for believing in me. The encouragement each of you provided kept me moving forward as I climbed this arduous mountain. This accomplishment would not have been possible without the love, support, and prayers of my family. This dissertation is dedicated to each of you.

TABLE OF CONTENTS

LIST OF TABLES

Table Page

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

A pedagogical shift is occurring in pre-licensure baccalaureate nursing education. The push from teacher-centered to student-centered methods is in response to the call for a reform in educational practices by the National League for Nursing (NLN), American Association of Colleges of Nursing (AACN), and the Institute of Medicine (IOM). As the focus of pedagogical methods is changing in nursing education, so is the generation of students. Many of the students enrolling in today's nursing programs are members of the millennial generation (Johanson, 2012). Millennials, individuals born between 1981 and 2000, are often described as optimistic, assertive, creative, committed, multitasking, cooperative team players (Howe & Strauss, 2000; Johanson, 2012; Mangold, 2007). These students enter the classroom learning environment as consumers of information who are expected to become lifelong learners (Stanley & Dougherty, 2010). Nursing faculty are challenged to identify the most appropriate student-centered strategies for promoting cognitive engagement and successful outcomes of this generation of learners. Hence, the subject of this study was factors that influence cognitive engagement in learning and academic success of pre-licensure baccalaureate millennial nursing students. This chapter describes the background, problem, purpose, and significance of this research. The conceptual framework that guided this study, research questions, and delimitations are discussed. Definitions of key terms are presented to increase the reader's understanding of the examined variables. This chapter concludes with the assumptions of this study.

Background

The curriculum of a baccalaureate nursing program must equip the nursing student with the knowledge, skills, and attitudes needed to practice effectively; while instilling the value of lifelong learning (AACN, 2008). Changes in the U.S. health care system and practice environments have identified new competencies needed for practice. New graduate nurses are expected to have skills that emphasize leadership, health policy, system improvement, research and evidence-based practice, and teamwork and collaboration (IOM, 2011). The addition of these competencies requires pre-licensure baccalaureate nursing programs to evaluate their educational processes. Current curricular models are burdened with content saturation. Nursing faculty often rely on traditional teacher-centered pedagogical approaches to make sure all of the material is covered (Brandon & All, 2010; Giddens & Brady, 2007; Kantor, 2010; Stanley & Dougherty, 2010). In turn, due to memorizing and reciting information students develop task-based competencies (Candela, Dalley, & Benzel-Lindley, 2006; IOM, 2011; Kantor, 2010). Changes in pedagogical approaches are needed to produce nursing students who are self-directed and able to synthesize information, link concepts, and think critically in the complex and changing practice environment (AACN, 2008; Brandon & All, 2010; Giddens & Brady, 2007; IOM, 2011; NLN, 2005).

Student-centered teaching strategies that encourage experiential learning, group interactions, and technology use are described as most appropriate for preparing the millennial nursing student to successfully transition to the complex practice environment (Gibson, 2009; Johanson, 2012; Mangold, 2007; McCurry & Martins, 2010). The use of such methods is believed to promote self-regulated learning and cognitive engagement while increasing knowledge acquisition of the millennial nursing student (Berry, 2009; McCurry & Hunter Revell,

2011, Strang, Bagnardi, & Utz, 2010). Engaged learning occurs when students are actively involved in cognitively processing new information in an environment that promotes interaction (Notarianni, Curry-Lourenco, Barham, & Palmer, 2009). Students who are cognitively engaged in learning are able to translate newly gained knowledge into practice while demonstrating academic motivation and persistence toward degree completion (McGlynn, 2007; Notarianni et al., 2009).

The use of student-centered methods requires a collaborative partnership between the faculty and nursing student in which the responsibility for learning is shared (Brandon & All, 2010; Levett-Jones, 2005; Patterson, Crooks, & Lunyk-Child, 2002). Nursing students should be encouraged to assume more ownership of learning outcomes to aid in the development of lifelong learning practices (Candela et al., 2006). Student ownership may be influenced by self-regulated processes. The student who demonstrates self-regulation in learning is more likely to succeed academically and develop lifelong learning skills (Zimmerman, 2002). Self-regulation in learning involves self-directive processes and self-beliefs that enable the learner to transform his/her cognitive abilities into academic performance behaviors (Zimmerman, 2008). Self-regulated learners control their own learning experiences through the use of different types of metacognitive and/or cognitive self-regulated strategies. Such strategies are used by the student when processing information within the classroom learning environment and during independent study endeavors.

A student's level of motivation may influence the effort and approach he/she takes to learning and applying new concepts. Self-efficacy is a motivational construct that affects such processes. Self-efficacy influences how an individual feels, thinks, and motivates him/herself to perform particular actions (Bandura, 1977). A positive correlation exists between self-efficacy

and academic behaviors (Blackman, Hall, & Darmawan, 2007; Clayton, Blumberg, & Auld, 2010; Landis, Altman, & Cavin, 2007). Students with a strong degree of self-efficacy undertake challenging tasks and appropriately adjust to the learning environment (Chemers, Hu, & Garcia, 2001). Conversely, students with low levels of self-efficacy are less likely to persist and seek help when they experience difficulty (Linnenbrink & Pintrich, 2003). In addition, students with high self-efficacy tend to use deeper processing strategies compared to students with less adaptive motivational beliefs (Duncan & McKeachie, 2005). The development of clinical reasoning skills and lifelong learning practices may be influenced by the cognitive self-regulated learning strategies used by the nursing student (Kuiper & Pesut, 2004). Rehearsal (e.g., reciting or repeating items from a list to be learned) is the most basic cognitive self-regulated learning strategy (Duncan & McKeachie, 2005). The use of this method may result in the nursing student only achieving task-based competencies. Elaboration (e.g., paraphrasing, summarizing) and organization (e.g., outlining, creating tables) are more complex cognitive self-regulated learning approaches (Duncan & McKeachie, 2005). The use of these deeper processing strategies may provide the nursing student with a foundation for higher-level competency based decision making skills.

Statement of the Problem

A national shortage of registered nurses is projected to occur between 2009 and 2030 (AACN, 2012). To meet the workforce demands, the IOM (2011) has called for increasing the number of baccalaureate prepared nurses in the workforce to 80%. Pre-licensure baccalaureate nursing programs are facing the demand to retain and graduate students who are prepared to meet the complex requirements of the health care environment. In response to the call for educational reform, nursing faculty are challenged to identify the best pedagogical methods for

educating the millennial generation of nursing students. The influence of student-centered approaches used in the classroom is documented in the nursing literature. However, this literature primarily presents anecdotal accounts and exploratory methods that describe teaching styles and instructor behaviors related to generational preferences (Gibson, 2009; Johanson, 2012; Mangold, 2007; McCurry & Martins, 2010; Pardue & Morgan, 2008; Walker et al., 2006). To meet the expectations of becoming lifelong learners nursing students should assume more ownership of learning outcomes (Candela et al., 2006). Thus, the effective use of student-centered methods requires a collaborative partnership. Investigation of the nursing student's self-regulated approaches to processing information presented in the classroom environment is lacking. This finding supported the need to further investigate the use of such strategies by senior-level pre-licensure baccalaureate millennial nursing students who will soon be transitioning to the practice environment. This study specifically explored the variables of self-efficacy, independent study behaviors, and grade point average to determine the relationship between cognitive engagement and academic success.

Purpose

The purpose of this study was to identify factors that influence cognitive engagement in learning and academic success of senior-level pre-licensure baccalaureate millennial nursing students. A quantitative descriptive correlational design was used for this study. This approach is useful for describing the relationships among variables (Polit & Beck, 2012). This study sought to examine (a) the use of cognitive self-regulated learning approaches by senior-level pre-licensure baccalaureate millennial nursing students and (b) the relationship between cognitive self-regulated learning approaches, self-efficacy, independent study behaviors, and grade point average. This study used the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich,

Smith, Garcia, & McKeachie, 1991) to assess the motivational construct of self-efficacy and cognitive self-regulated learning approaches (e.g., rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students. Two questions addressing the additional variables of interest was added to the survey tool. (a) What is the number of hours you spend a week studying for this course? (b) What is your cumulative grade point average (GPA)? A paper survey was administered to a convenience sample of senior-level pre-licensure baccalaureate millennial nursing students enrolled in a nursing theory course at one academic institution.

Significance

The nursing profession is currently facing a shortage of qualified individuals to replenish the workforce. Nursing education is beginning to move from teacher-centered practices to student-centered approaches to produce nursing students who can successfully transition to the complex health care environment (Valiga, 2012). Educational methods that encourage the use of self-directed approaches to learning may result in nursing students who are able to synthesize information, link concepts, and demonstrate higher level competency based decision making skills. Ultimately, better equipping the pre-licensure baccalaureate millennial nursing student with the skills needed for lifelong learning practices may positively impact the quality of patient care he/she provides. Therefore, a study that addresses factors that influence cognitive engagement in learning and academic success of senior-level pre-licensure baccalaureate millennial nursing students is important for several reasons. Research that has identified and evaluated this cohort's cognitive self-regulated approaches to learning as an influential factor of academic success is lacking. In addition, the nursing discipline lacks empirical evidence regarding the relationship between cognitive self-regulated learning approaches, independent

study behaviors, and academic success of this generation of learners. In addition, self-efficacy is described as a cognitive variable that affects performance behaviors and affective processes (Robb, 2012). A student's perception of self-efficacy is changeable and sensitive to contextual factors (Linnenbrink & Pintrich, 2003). Therefore, exploring and understanding the role of self-efficacy as a motivational construct in student learning is imperative.

To know how to adequately prepare senior-level pre-licensure baccalaureate millennial nursing students for the complex practice environment, nursing faculty should have an understanding of the interrelationship between self-regulated approaches to learning, cognitive engagement, and successful academic outcomes. This study provides insight into the ways senior-level pre-licensure baccalaureate millennial nursing students perceive, interact, and respond to the environment in which their learning occurs. Knowledge of the effects of self-efficacy may enable the nurse educator to focus attention on the influence of the student's perceptions when facilitating learning in the classroom environment. Results from this study may assist faculty in the development and implementation of instructional methods that will strengthen self-efficacy perceptions, promote a shared responsibility for learning, encourage the use of deeper processing strategies, and build a foundation for higher-level competency based decision making skills. In turn, senior-level pre-licensure baccalaureate millennial nursing students will be adequately prepared for the complex health care environment. Thus, a diverse cohort of skilled professionals and lifelong learners will replenish the nursing workforce.

Conceptual Framework

Social cognitive theory served as the conceptual framework for this research. This theory emphasizes the role of self-regulation and motivational constructs in the student's learning process. Social cognitive theory proposes individuals learn through a reciprocal relationship

among cognitive, behavioral, and environmental factors (Bandura, 2001). Self-efficacy is a key component in social cognitive theory. Bandura (1977) defined self-efficacy as an individual's perception of his/her capabilities to produce designated levels of performance. Self-regulated approaches to learning, cognitive engagement, and outcome measures of learning have been associated with self-efficacy (Blackman et al., 2007; Choi, 2005; Clayton et al., 2010; Landis et al., 2007; Linnenbrink & Pintrich, 2003; Zimmerman, 2000).

Research Questions

This study sought to answer the following questions regarding factors that influence cognitive engagement in learning and academic success of senior-level pre-licensure baccalaureate millennial nursing students.

- Which cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) do senior-level pre-licensure baccalaureate millennial nursing students report using to understand content in a nursing theory course?
- What is the relationship between independent study behaviors and the cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students to understand content in a nursing theory course?
- What is the self-efficacy score for senior-level pre-licensure baccalaureate millennial nursing students enrolled in a nursing theory course?
- What is the relationship between self-efficacy and the cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students to understand content in a nursing theory course?

- What is the relationship between grade point average and the cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students?

Delimitations

This study was delimited by the use of a sample of nursing students from one academic institution. Use of a convenience sample limits the generalizability of this study's findings. Therefore, the findings may only pertain to a limited geographical area and only to senior-level pre-licensure baccalaureate millennial nursing students. An additional delimitation of this study was the use of a self-reported survey tool. This introduced the possibility of attribution and exaggeration by the participants.

Definitions of Terms

The following are definitions of key terms used throughout this study.

- Pre-licensure baccalaureate millennial nursing students: Students who were born between 1981 and 2000 (Howe & Strauss, 2000; Johanson, 2012; Mangold, 2007), and are enrolled in a four year baccalaureate nursing program designed to prepare students for professional licensure and entry into practice.
- Self-regulated learning: Refers to the self-directive processes the student uses, and the self-beliefs he/she has that influences his/her cognitive abilities and academic performance behaviors (Zimmerman, 2008).
- Cognitive engagement: Refers to the quality of effort the student puts into learning. Students who demonstrate cognitive engagement within the classroom environment think about the content to be learned, evaluate what they know and do not know, and use self-

regulated learning strategies that increase their understanding of the content (Linnenbrink & Pintrich, 2003).

- Cognitive self-regulated learning strategies: Refers to strategies the student uses to process material presented in the classroom environment. There are three specific strategies.
    - Rehearsal: Refers to the most basic cognitive self-regulated learning strategy. Rehearsal involves repeating or naming items from a list to be learned (Duncan & McKeachie, 2005). Rehearsal is considered a surface processing strategy that does not result in the acquisition of new knowledge in long-term memory (Pintrich et al., 1991). In this study, use of the strategy was measured by 4 items on the MSLQ.
    - Elaboration: Refers to a complex cognitive strategy. Elaboration involves paraphrasing and summarizing newly learned content (Duncan & McKeachie, 2005). Elaboration is considered a deep processing strategy that allows the student to integrate and connect new information with prior knowledge (Pintrich et al., 1991). In this study, use of the strategy was measured by 6 items on the MSLQ.
    - Organization: Refers to a complex cognitive strategy. Organization involves outlining and identifying the main idea of newly learned content (Duncan & McKeachie, 2005). Organization is considered a deep processing strategy that results in better performance (Pintrich et al., 1991). In this study, use of the strategy was measured by 4 items on the MSLQ.

- Self-efficacy: Refers to a motivational construct that influences cognitive engagement. Self-efficacy is an individual's perception of his/her capabilities to produce designated levels of performance (Bandura, 1977). In this study, perception of self-efficacy was measured by 8 items on the MSLQ.
- Independent study behaviors: Refers to the number of hours per week spent studying. For this study, independent study behaviors was measured by the pre-licensure baccalaureate millennial nursing student's self-reported number of hours spent studying a week for a nursing theory course. This involved any work that was completed outside of the scheduled class time.
- Academic success: Refers to successful attainment of course objectives. For this study, academic success was measured by the pre-licensure baccalaureate millennial nursing student's self-reported cumulative grade point average.

Assumptions

The underlying assumptions of this study included the following:

- Senior-level pre-licensure baccalaureate millennial nursing students display the generational characteristics as defined by Howe and Strauss (2000).
- Senior-level pre-licensure baccalaureate millennial nursing students prefer student-centered learning approaches.
- Nursing faculty use student-centered learning strategies in nursing theory courses.
- Self-efficacy is a motivational construct that influences learning and academic behaviors.

Chapter Summary

The focus of this study was factors that influence cognitive engagement in learning and academic success of senior-level pre-licensure baccalaureate millennial nursing students. This

chapter presented the case for exploring the variables of self-efficacy, independent study behaviors, and grade point average. Chapter Two provides a review of the literature on these variables and the survey tool used in this study.

CHAPTER TWO

LITERATURE REVIEW

This chapter begins with a discussion regarding the conceptual framework for this study, social cognitive theory. The role of self-regulation and cognitive engagement in learning is defined. In addition, a discussion regarding the significance of self-efficacy as a motivational construct is presented. The second portion of this chapter addresses cognitive self-regulated learning strategies used by students enrolled in higher education. The association between use of such strategies and academic success is identified. Additionally, the relationship between independent study behaviors and use of cognitive self-regulated learning strategies is explored. Lastly, literature pertaining to the development and application of the Motivated Strategies for Learning Questionnaire (MSLQ) is reviewed.

Social Cognitive Theory

Social cognitive theory served as the conceptual framework for this research. Bandura's (1986) triadic model of social cognitive theory emphasizes the role of self-regulation and motivational constructs in the learning process. This theory assumes an agentic perspective, meaning individuals have the ability to exercise control over events that shape their lives. Social cognitive theory proposes an individual learns through a reciprocal relationship among cognitive, behavioral, and environmental factors (Bandura, 2001). Within this model the learner plays a pivotal role in the deliberative development and application of academic goal directed thoughts and actions (Bandura, 2001). Key processes completed by the learner include self-observation, self-judgment and self-reactions. An individual forms beliefs regarding what actions he/she can perform based on observing others and evaluating the outcomes of his/her own prior actions (Bandura, 1986). The academic environment provides motivation and situational opportunities

for which the learner constructs outcome expectations. Through internal mechanisms including self-reflection and self-judgment the learner regulates his/her behaviors, sets goals, and plans a course of action that is likely to yield desired results (Bandura, 1991). Regulating behavior by outcome expectations encourages the learner to choose actions that are likely to produce positive outcomes and avoid those that produce negative or less favorable results (Bandura, 2001).

Self-Regulation and Cognitive Engagement in Learning

Student-centered models of baccalaureate nursing education are believed to better align with current and future practice needs (National League for Nursing, 2005; O'Shea, 2003; Patterson et al., 2002). The paradigm shift toward student-centered methods requires a collaborative partnership in which the student assumes more ownership of learning outcomes. Student ownership may be influenced through self-regulated processes. Self-regulation in learning refers to the self-directive processes and self-beliefs that enable the learner to transform his/her cognitive abilities into an academic performance behavior (Zimmerman, 2008). The student who self-regulates is more likely to succeed academically due to his/her motivation and adaptive learning methods (Zimmerman, 2002). Self-regulation is viewed as an integral component in the development of clinical reasoning skills and appears to be positively associated with the development of skills related to lifelong learning (Kuiper, 2005; Kuiper, Murdock, & Grant, 2010; Kuiper & Pesut, 2004; O'Shea, 2003; Patterson et al., 2002).

A review of nursing literature related to self-regulated processes (O'Shea, 2003) stressed the importance of helping students adopt self-regulated learning strategies. Two broad categories of self-regulated learning strategies include metacognitive and cognitive approaches (e.g., rehearsal, elaboration, organization). A discussion regarding these strategies is included in the second portion of this chapter. Use of such strategies requires student awareness or

metacognition of his/her learning needs (Pintrich & DeGroot, 1990). A student's use of metacognitive knowledge directly influences his/her use of self-regulated approaches and engagement in learning (Zimmerman, 1990).

Student engagement in learning can be categorized as behavioral, cognitive, and motivational (Linnenbrink & Pintrich, 2003). Research addressing factors that influence cognitive engagement in nursing education is lacking. Therefore, the focus of this study was cognitive engagement. Cognitive engagement refers to the quality of effort the student puts into learning classroom content. Within the classroom environment, students who are cognitively engaged in the learning process think deeply about the newly presented information and use self-regulated learning strategies that increase their understanding of the material (Linnenbrink & Pintrich, 2003). The self-regulated student is able to differentiate between facts and skills they do or do not know and possess (Zimmerman, 1990). He/she is able to assess the academic task and set goals for studying (Hadwin, Winne, Stockley, Nesbit, & Woszczyna, 2001). In addition, the self-regulated learner monitors and regulates his/her cognitions and behaviors, and implements adjustments to the learning approach when needed to ensure academic success (Pintrich, 2004; Zimmerman, 2008). Figure 1 illustrates the cyclic process in which the student monitors and reacts to the effectiveness of his/her self-regulated approaches to learning.

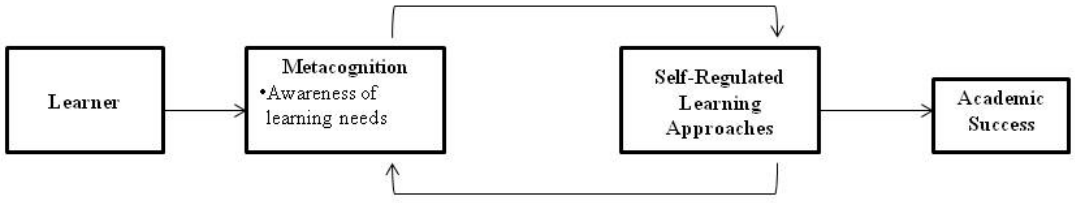

Figure 1. Model of cyclic process of self-regulatory learning.

Self-regulation is situational, content specific, and varies between individuals and activities. Therefore, self-regulation in learning should be viewed as a continuum in which the student demonstrates varying degrees of self-regulated behaviors (Pintrich & DeGroot, 1990). Individuals develop self-regulated behaviors from the reciprocal influence of external and internal factors (Bandura, 1986).

External factors include the learning environment and pedagogical approaches that facilitate the student to cognitively engage in planning, implementing, and evaluating learning. Nursing research has begun to explore external factors that may influence the adoption of self-regulated learning strategies. Greater exposure to course content was determined to be an influential factor in a descriptive exploratory study (Mullen, 2007). A convenience sample (N = 125) of two cohorts of baccalaureate nursing students enrolled in a 12 month accelerated nursing program comprised the study sample. The first cohort (n = 76) completed two thirds of their required program coursework. The second cohort (n = 49) completed one third of their required program coursework. All students had previously earned a degree in a discipline other than nursing. Approximately half of the participants in both groups reported having previous health care experience. Students completed the *Motivated Strategies for Learning Questionnaire* during a class session to assess the extent of self-regulated strategy use. There was a significant difference in scores ($F(1, 102) = 5.67$, $p = 0.019$) for the cognitive self-regulated learning strategy of rehearsal between the first ($M = 4.67$, $SD = 1.27$) and second ($M = 4.37$, $SD = 1.12$) cohort. Likewise, there was a significant difference in scores ($F(1, 102) = 7.16$, $p < 0.01$) for the cognitive self-regulated learning strategy of organization between the first ($M = 4.87$, $SD = 1.28$) and second ($M = 4.36$, $SD = 1.21$) cohort. The findings from the study suggest the adoption of self-regulated learning strategies may be influenced by the exposure to content one receives

while progressing through a program. The students who completed two thirds of their coursework had experienced greater exposure to content and more clinical learning opportunities. Through self-reflection, these students may have been influenced to adopt more efficient strategies for processing content as they progressed through the program. However, use of a convenience sample of students from a single accelerated nursing program limits the generalizability of the results. In addition, all of the participants had previously earned a degree. Approximately half of the participants also reported previous health care experience. Effects of either were not controlled for. Thus, one must question what additional variables may have contributed to the results of the study.

Similar findings were concluded in a descriptive study that evaluated the changes that occurred in student self-regulated learning strategies when clinical hours were increased from 60 to 120 hours (Kuiper et al., 2010). A convenience sample (N = 26) of senior-level baccalaureate nursing students enrolled in a clinical practicum course participated in the study. The clinical practicum consisted of 60 hours for one group and 120 hours for the second group. Both groups completed the practicum course at the same setting. The number of students in each group was not discussed by the authors. Throughout the study students completed weekly journal entries in which they reflected on activities that occurred during the clinical week. The entries were analyzed using descriptive statistics to determine the word count. The predominant categories of narrative content were identified by the researcher categorizing sequences of task-relevant statements. The statements were then analyzed with a coding scheme. Retrospective verbal protocol analysis (RVPA) was used to examine the presence of self-regulated thinking processes related to problem solving. Analysis revealed the 120-hour practicum group used more self-evaluation reasoning strategies (34.8%) than the 60-hour practicum group (22.4%). Referring

phrase analysis was completed to identify noun and referent phrases the students used when reflecting about clinical situations. An independent samples t-test was completed to detect any differences in referring phrase nouns between the two groups. Significant differences ($t = -14.11$, $p < .0005$) were noted for thinking strategies used between the two groups. The authors did not address which thinking strategies were used. Also, assertional phrase analysis was completed to identify the relationships between nouns, connectives, and operators used in the entry statements. The analysis revealed differences between the groups regarding awareness of learning needs. The 60-hour group used more past tense verbs (57%) than the 120-hour group (43%). The authors concluded this demonstrated the students relied on previously learned knowledge. The 120-hour group used more present and future tense verbs (62%) than the 60-hour group (38%). The authors concluded this revealed a greater attention to present understanding of content and forward reasoning. The findings from the study are similar to the conclusions drawn by Mullen (2007). The results suggest an increase in clinical hours may have promoted a greater use of self-evaluation. Self-evaluation may have influenced the use of self-regulated approaches to learning. However, the study is limited by use of purposive sampling from a single geographical area. In addition, use of self-reported measures such as journaling introduces the possibility of bias. Students may have structured their responses in a manner they felt was most acceptable or desirable of the reader. The occurrence of forgotten or exaggerated accounts is also possible. Furthermore, one cannot exclude the possibility of other factors that may have influenced the results of the study. For example, different experiences in the clinical learning environment or varying degrees of feedback received from the instructor.

Internal factors that may influence the student's use of self-regulated learning strategies include personal characteristics and independent behaviors. While nursing research has explored

the influence of internal factors on academic success (Ofori & Charlton, 2002), knowledge of internal factors that influence self-regulated learning of the nursing student is limited. Therefore, an internal variable of interest for this study was self-efficacy. The role of self-efficacy as a motivational construct in self-regulated learning is not well understood. In the previously discussed research of Kuiper et al. (2010), referring phrase analysis was completed to identify noun and referent phrases related to self-efficacy. Significant differences in referring phrase nouns related to self-efficacy were noted between the 60 and 120 hour groups ($t = -3.14$, $p = .008$). However, the internal influence self-efficacy had on the adoption of self-regulated strategies by the 120 hour group was not explored. Before nurse educators can encourage students to adopt self-regulated learning strategies, further exploration of this motivational construct is warranted. Empirical research needs to be completed to determine the validity of the relationship between self-efficacy and self-regulated learning strategies used by pre-licensure baccalaureate millennial nursing students.

Self-Efficacy as a Motivational Construct

A student's motivation to engage in self-regulated learning may depend on internal factors related to his/her goals and values, beliefs about ability to succeed, and anxiety regarding evaluative methods (Duncan & McKeachie, 2005). Self-efficacy is a motivational construct that reflects a personal judgment of one's capabilities to organize and execute courses of action to achieve identified goals (Bandura, 1977). The focus of this study was to further explore and understand the role of self-efficacy as a motivational construct in the use of self-regulated learning approaches by senior-level pre-licensure baccalaureate millennial nursing students. Figure 2 illustrates the proposed role of self-efficacy as a motivational construct in self-regulated learning.

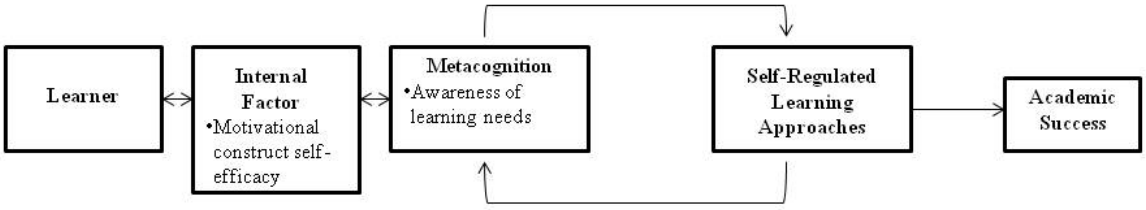

Figure 2. Model of self-efficacy as a motivational construct.

Similar to self-regulated behaviors, self-efficacy is situational, task dependent, and influenced by various factors. Mastery experiences are the greatest influence on the development of an individual's perceived self-efficacy. However, individuals can also be influenced through vicarious experiences. Observing individuals similar to oneself succeed in goal attainment raises the observer's belief that he/she can also master the activity (Bandura, 1977). Furthermore, individuals who are persuaded that they possess the ability to master an activity are likely to apply greater effort for goal attainment (Bandura, 1977). Successful goal attainment increases an individual's perceived level of self-efficacy and encourages the pursuit of more complex goals. In contrast, when facing the demands of a situation, an individual with a lower degree of self-efficacy visualizes personal inadequacies and dwells on the things that could go wrong (Bandura, 1977). Moreover, this individual may experience high levels of anxiety and possibly avoid future situations where he/she feel challenged (Bandura, 1982). Thus, experienced failures may lower an individual's perception of perceived self-efficacy and result in avoidance behaviors (Bandura, 1977).

Nursing education research supports the belief that mastery experiences, vicarious experiences, and feedback may impact a students' perceived level of self-efficacy. A descriptive study was completed to investigate the effect of classroom simulation on nursing students' self-efficacy in health teaching (Goldenberg, Andrusyszyn, & Iwasiw, 2005). A convenience sample of all female (N = 22) third year baccalaureate nursing students completed a researcher created

survey pre- and post-simulation workshop sessions. The survey consisted of 63 items related to baccalaureate nursing student's teaching-learning self-efficacy. Validity and reliability was established by the author. Cronbach's alpha coefficient was reported as 0.97. Two half-day workshops were held right before the end of the first-semester classes. Working in small groups, students role played characters and analyzed the simulated case scenarios being presented. Students were to assess the client's learning needs and develop a teaching plan. Statistical analysis revealed significantly higher ($p = .001$) self-efficacy scores following the simulation experience ($M = 3.55$ post-simulation; $M = 2.96$ pre-simulation). The authors concluded successful performance in the simulated situations was the most influential source of self-efficacy. However, vicarious experience through observing a peer in the simulations and verbal persuasion from the faculty may have also raised the students' self-efficacy expectations. While the study supports the proposed factors that influence self-efficacy, the findings have limited generalizability. The sample of subjects was small and lacked diversity. Statistical results computed from a small sample should be viewed with caution. The students' self-reported measures of self-efficacy may have been exaggerated. The students may have responded in a manner they felt was most acceptable or desirable of the researcher.

More recently nursing education research has begun to explore the relationship between pedagogical methods and self-efficacy. A mixed methods study was completed to assess the effect of lecture alone and lecture with accompanied simulated learning activities on nursing students' perceptions of self-efficacy for nursing practice (Sinclair & Ferguson, 2009). The participants ($N = 174$) were recruited from students enrolled in the second year of a baccalaureate nursing program in southwestern Ontario. The nursing program was offered at two sites. One site served as the intervention group ($n = 74$), while the second site was the

control group (n = 100). All participants were enrolled in a second year theory course that focused on health challenges across the lifespan. Five lecture topics were selected for the study. The control group received two hour lectures on each of the topics. The intervention group received a one hour lecture for each topic followed by a one hour simulated learning activity. Each simulation consisted of a clinical scenario that used a moderate fidelity mannequin. All students were asked to complete a modified version of the *Baccalaureate Nursing Student Teaching-Learning Self-Efficacy Questionnaire* pre- and immediately post-lecture/simulated learning activity. The modified tool contained 16 items. The original tool consisted of 63 items with a reported Cronbach's alpha coefficient of 0.97. The authors did not report the Cronbach's alpha coefficient of the modified tool. While students were required to attend lectures/simulated learning activities as part of the course requirements, completion of the questionnaires were voluntary. Throughout the study, response rates varied from 23 to 75 of the 75 participants for the control group and 26 to 68 of the 100 participants for the intervention group. Data analysis revealed all but one simulated learning activity resulted in significant differences between the pre- and post-test scores for the intervention group. The simulated activities associated with a significant difference included: post-operative client ($t = -3.23$, $p = .002$), child with upper respiratory infection ($t = -2.17$, $p = .033$), client with hip replacement ($t = 2.22$, $p = .031$), and client with congestive heart failure ($t = 3.56$, $p = .001$). In addition to these findings, qualitative analysis of reflective reviews voluntarily completed by participants (n = 12) suggested students indicated greater levels of confidence after engaging in the combined lecture/simulation activities. Similar to the conclusions of Goldenberg et al. (2005), peer learning during the simulated activities was identified as a factor that may have influenced the changes in self-efficacy perceptions. While the research highlights the influence of pedagogical methods on the

development of self-efficacy, findings should be interpreted with caution. Use of a non-randomized convenience sample limits the generalizability of the results. In addition, the reported varying response rates and omission of the reliability of the modified tool raises concern regarding the validity of the statistical results.

Self-efficacy is also believed to influence knowledge acquisition. Highly efficacious students are assumed to process information more successfully (Zimmerman, 2000). While limited, findings from nursing education research further supports this assumption. A convenience sample (N = 112) of baccalaureate nursing students preparing for their first clinical experience was surveyed (Bambini, Washburn, & Perkins, 2009). Of the participants the majority (57%) had previous health care field experience. In addition 26 percent had completed a prior baccalaureate degree. As part of the orientation process the students completed a simulation regarding postpartum and newborn nursing. The students answered a researcher created survey pre- and post-simulation. The survey consisted of six questions that assessed self-efficacy beliefs. Cronbach's alpha coefficient was reported as 0.817 for the pre-test and 0.858 for the post-test. Data analysis indicated a significant change ($t = -20.88$, $p = < .01$) in students' self-efficacy in performing postpartum nursing skills after participation in the simulation. Findings from the study support the assumption that knowledge acquisition may be influenced by perceived levels of self-efficacy. However, use of a convenience sample from one geographical area limits the generalizability of the study. The study also used self-reported data which is subject to social-response bias. Another limitation was the variability in each student's experience due to his/her previously obtained degree and experience in the health care field. Effects of such experiences were not controlled for. Thus, one must question what additional variables may have contributed to the results of the study.

Summary

A discussion regarding social cognitive theory was presented in this section. The role of self-regulation and cognitive engagement in learning was defined. Literature regarding external factors that influence self-regulated learning was presented and critiqued. The limited knowledge of internal factors that influence self-regulated learning of the nursing student was identified. In addition, the significance of self-efficacy as a motivational construct was presented. A critique of nursing education literature related to self-efficacy, influential factors, pedagogical methods, and knowledge acquisition was offered. However, the use of convenience samples limits the generalizability of the findings. Furthermore, the majority of the conclusions resulted from the findings of a single study. Additional research that replicates such findings is warranted.

The previously discussed nursing education literature primarily illuminated the perceived relationship between self-efficacy, clinical reasoning skills and simulated learning. Thus, based on the presented findings it is impossible to determine if an influential relationship exists between self-efficacy and knowledge acquisition in the classroom environment. This study sought to further illuminate the relationship between self-regulation, motivational influences, and academic success. This study assessed the influence of self-efficacy on the use of cognitive self-regulated learning strategies by the pre-licensure baccalaureate millennial nursing student to process classroom content. The following section will addresses cognitive self-regulated learning strategies used by students enrolled in higher education. The association between use of cognitive self-regulated learning strategies and academic achievement will be identified. The relationship between independent study behaviors and use of cognitive self-regulated learning strategies will be explored.

Cognitive Self-Regulated Learning Strategies

Self-regulated learners control their own learning experiences through the use of different types of learning strategies. Self-regulated strategies are adaptive thought processes and behaviors that are intended to positively influence the learner's knowledge acquisition. Two broad categories of self-regulated learning strategies include metacognitive and cognitive approaches. Metacognitive strategies address the student's perceived ability to plan, monitor, and regulate his/her own cognition. Cognitive strategies refer to the approaches the student takes to understand information. The focus of this research was the quality of effort and strategies used by pre-licensure baccalaureate millennial nursing student to process classroom content. Therefore, the use of cognitive strategies was the interest of this study. The self-regulated learner uses cognitive strategies to process new information from texts and lectures into short and long term memory (Duncan & McKeachie, 2005). These strategies also assist the learner in relating new information to previously acquired knowledge. Thus, cognitive self-regulated learning strategies influence both surface and deep information processing by the learner (Entwistle & McCune, 2004). Figure 3 depicts the cognitive strategies of interest for this research. The strategies of rehearsal, elaboration, and organization will be discussed in the following section. This figure illustrates the proposed model of self-regulated learning used in a classroom based nursing theory course.

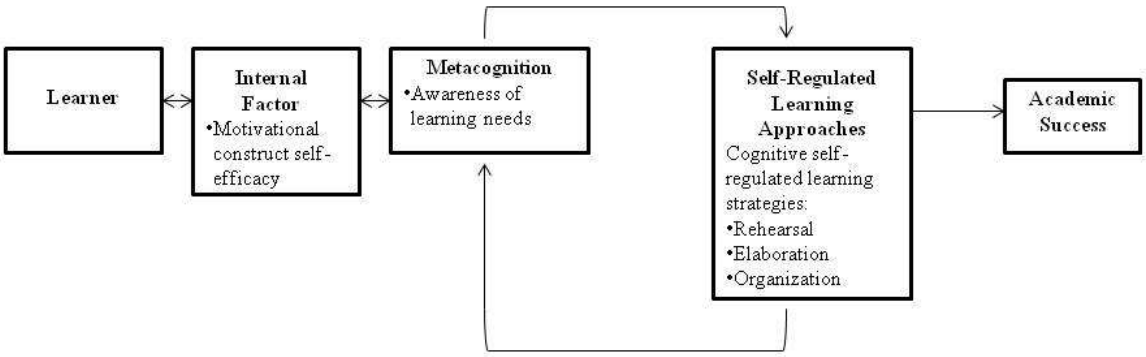

Figure 3. Model of self-regulatory learning.

Rehearsal

Rehearsal is considered the most basic cognitive self-regulated learning strategy. This strategy involves repeating, memorizing, or naming items from a list to be learned (Duncan & McKeachie, 2005). Rehearsal is considered a strategy that influences surface information processing; thus, making it an appropriate method for simple learning tasks (Entwistle & McCune, 2004). However, rehearsal could also be used by the learner as an initial strategy for processing complex material (Duncan & McKeachie, 2005). The following section reviews research literature related to the use of rehearsal in higher education. No studies were found in the literature discussing the use of rehearsal in nursing education.

Rehearsal was reported as the prominent approach used by a large convenience sample (N = 458) of students enrolled in an introductory chemistry course (Zusho & Pintrich, 2003). Students completed three self-reported surveys at three different time points over the course of the semester. The intent of the study was to investigate how students' level of motivation and use of cognitive strategies changed over time. The surveys contained items from the *Patterns of Adaptive Learning Survey* and the *Motivated Strategies for Learning Questionnaire*. The use of rehearsal was positively related to achievement. More high achieving students (n = 132, M = 3.78, SD = 0.65) used rehearsal than lower achieving students (n = 144, M = 3.24, SD = 0.74)

when surveyed at the middle of the course. However, the use of rehearsal by high achieving students decreased by the end of the course (n = 132, M = 3.17, SD = 0.66). Instead, more high achievers reported using the deep processing strategy of elaboration when compared to both average and low achievers ($F(2, 426) = 4.548$, $p < 0.05$) at 10 weeks into the semester. Achievement level was determined by course grade. In addition, high achieving students self-efficacy levels increased over time and low achieving students' self-efficacy levels decreased over time ($F(4, 420) = 22.99$, $p < .001$). The findings suggest as high achieving students became more proficient in processing course material, their levels of self-efficacy increased. Thus, they may have been influenced to use a deeper approach for processing course material. While a large number of students participated in the study, use of a convenience sample limits generalizability. In addition, the participants were not enrolled in the same section of the course. Thus, one must question what additional mediator variables may have influenced the results. Furthermore, the relationship between self-efficacy and self-regulated learning strategies is assumed. Statistical analysis using a Pearson product-moment correlation would have allowed for a more definitive interpretation of a relationship.

Similar findings related to rehearsal were concluded in a longitudinal study of adult learners. A convenience sample (N = 271) of first year constructional architecture and mechanical engineering students completed the *Inventory of Learning Styles* questionnaire three times over nine months (Severines, Ten Dam, & Van Hout Wolters, 2001). The students were enrolled in five separate technical colleges in the Netherlands. A t-test revealed at the beginning of the year students more often used rehearsal than deep processing strategies ($t(270) = 2.34$, $p < 0.05$). By the end of the year the same students reported using more deep processing approaches ($t(271) = 1.99$, $p < 0.05$). These results further support the belief that the learner may use

rehearsal as an initial strategy for processing complex material (Duncan & McKeachie, 2005). However, use of a convenience sample of students enrolled in an international program limits the generalizability of the stated findings. One cannot infer that classroom structure, implemented pedagogical methods, and students' approaches to learning are similar to educational practices in the United States.

Elaboration

Elaboration is considered a complex cognitive self-regulated learning strategy. Elaboration is a deep processing approach that allows the learner to integrate and connect new content with prior knowledge (Pintrich et al., 1991). Deep processing strategies are adaptable to more complex learning tasks. The use of such strategies is believed to signal the student's active involvement in the learning process (Pintrich, 2004). Elaboration involves paraphrasing, summarizing, forming analogies, and mental imagery (Duncan & McKeachie, 2005; Willoughby, Wood, & Kraftcheck, 2003). The following section reviews research literature related to the use of elaboration in higher education. No studies were found in the literature discussing the use of elaboration in nursing education.

The use of elaboration is most frequently associated with academic success. Students enrolled in an introductory psychology course ($N = 114$) were provided a handout detailing several suggestions (self-help quizzes, course-performance chart, question and answer, lecture notes, study groups, and elaboration techniques) designed to promote self-assessment and comprehension (Balch, 2001). At the end of the course, students rated the degree to which the tips were used on a scale from 0 (not at all) to 10 (very much). The use of elaboration strategies was the only study tip significantly correlated to course performance ($r = .19$, $p < .05$). Course performance was measured by total points earned in the course. The results of the study suggest

educating students on how to study course material may result in use of deeper processing approaches and academic success. However, findings from the study should be interpreted cautiously. While significant, the reported correlation statistic denotes a relatively weak relationship.

Similar results were reported from a study that evaluated students' approaches to learning (Heikkila & Lonka, 2006). A convenience sample (N = 197) of students enrolled in an elective course at a university in Finland were surveyed. The students were from a variety of academic disciplines and at different phases in their university education. The *Task Booklet of Learning* and the *Strategy Attribution Questionnaire* was administered during the first class session of the course. Pearson product-moment correlations revealed approaches related to elaboration were positively correlated with grade point average (r = .16, $p < .05$). Grade point average reflected the student's overall cumulative grade point average in university studies. Whereas, strategies associated with rehearsal were negatively correlated with grade point average (r = -.46, $p < .01$). However, use of a convenience sample of students enrolled in an international program limits the generalizability of the stated findings. One cannot infer that curriculum policies and evaluative methods are similar to educational practices in the United States. In addition, while significant, the reported correlation statistic regarding elaboration denotes a relatively weak relationship. Conversely, use of elaboration was also found to have a negative relationship with academic success. The use of study strategies was assessed in a convenience sample (N = 176) of undergraduate students enrolled in an introductory statistics course (Bandalos, Finney, & Geske, 2003). The students completed the *Motivated Strategies for Learning Questionnaire* after midterm and final course exams. Path analysis revealed the use of elaboration was negatively related (PC = -.21, $p < .05$) to midterm exam grades. The finding suggests the use of deep

processing strategies before the development of a basic understanding of content may lead to confusion. Therefore, the results further support the suggestion that the initial use of a surface processing strategy (e.g., rehearsal) may lead to the successful application of more complex approaches (Duncan & McKeachie, 2005). In addition to assessing strategy use, levels of self-efficacy were evaluated. Unlike the previous discussed findings of Zusho and Pintrich (2003), the relationship between self-efficacy and the use of deep processing strategies was not found to be significant by Bandalos et al. (2003). However, the study is limited by use of purposive sampling from a single geographical area. The students' self-reported measures of self-efficacy may have been exaggerated. The students may have responded in a manner they felt was most acceptable or desirable of the researcher.

Organization

Organization is also referred to as a complex cognitive self-regulated learning strategy. Organization is considered a deep processing approach that results in better performance (Pintrich et al., 1991). This strategy involves grouping, outlining, and diagramming the main idea of newly learned content (Duncan & McKeachie, 2005). The following section reviews research literature related to the use of organization in higher education and nursing education.

A study assessing college students' use of self-regulating learning strategies concluded use of organization may be associated with particular academic disciplines (Vanderstoep, Pintrich, & Fagerlin, 1996). A convenience sample (N = 380) of college students from three different intuitions were surveyed. The students were enrolled in humanities, social science, or natural science college courses. The *Motivated Strategies of Learning Questionnaire* was administered at the beginning and end of the course. To control for differences in grading distributions, students were categorized as low, middle, or high achievers based on their final

course grades within each discipline. One-way analysis of variance revealed a significant difference of organization scores for natural science students at the beginning ($F (2, 135) = 8.73$, $p < .001$) and end of the semester ($F (2, 128) = 11.4$, $p < .0001$). Higher final-grade students had significantly higher organization scores. Similar results were seen with the social science group ($F (2, 92) = 3.32$, $p < .05$; $F (2, 92) = 3.84$, $p < .05$). However, the use of organization for the humanities courses was only significant for the high-final grade students at the end of the semester ($F (2, 68) = 4.25$, $p < .05$). The results suggest course requirements, assignments, and evaluation methods may contribute to the differences between academic disciplines. The findings support the belief that self-regulated behaviors vary based on external and internal factors (Pintrich & DeGroot, 1990). However, the conclusions drawn from the study are limited by the contextual factors the participants were exposed to within their specific academic disciplines. Similar to the findings presented of Zusho and Pintrich's (2003) study, Vanderstoep et al. (1996) found that high achieving students had higher self-efficacy scores in all three disciplines at the end of the semester. However, the relationship between self-efficacy and strategy used was not explored.

Use of organization may also be dependent on students' experiences within their program of study. In the previously discussed study by Mullen (2007) significant differences ($F (1, 102) = 7.16$, $p < .01$) between two cohorts of students were noted. Students ($n = 76$) in the first cohort reported significantly higher use of organization ($M = 4.87$, $SD = 1.28$) than students ($n = 49$) in the second cohort ($M = 4.36$, $SD = 1.21$). Although other factors may influence self-regulatory strategy use, the findings suggest greater exposure to content provides students with more experience to become proficient in processing course material. However, as discussed earlier all of the participants had previously earned a degree in a discipline other than nursing. Therefore,

the self-regulated approaches to learning by students who have already completed a degree may be different from first time degree seeking students. Thus, the findings should be interpreted with caution. Similar results should not be assumed for first time degree seeking students.

Summary

Higher education research provides insight into the self-regulated learning strategies used by students to process classroom material. The use of measurement tools with established reliability and validity strengthened the conclusions drawn from the research. However, the use of convenience samples, differences in sampling procedures, and inconsistencies in the definition of academic success limits the generalizability of the findings.

Consistent with social cognitive theory, the interrelationships of external and internal influences on adopting self-regulating behaviors were reflected in the studies. The academic environment, exposure to content, and study time were suggested as variables that influence cognitive self-regulated strategy use. However, the majority of these recommendations resulted from the findings of a single study. Additional studies that replicate such findings are warranted. In addition, the presented studies did not consistently explore motivational constructs in relation to use of cognitive self-regulated strategies. Thus, based on the presented findings it is impossible to determine if an influential relationship exists between strategy use, independent study behaviors, self-efficacy, and academic achievement.

As evidenced by the review of literature, nursing education lacks empirical research addressing the use of cognitive self-regulated strategy use. Of the presented studies, only one was from the discipline of nursing education. The extent to which, and what factors influence cognitive self-regulated strategies by pre-licensure baccalaureate millennial nursing students is unknown. The findings from this review of literature are essential for further investigation

within this population of students. To know how to adequately prepare senior-level pre-licensure baccalaureate millennial nursing students for the complex practice environment, nursing faculty should have an understanding of the interrelationship between approaches to learning, cognitive engagement, and successful academic outcomes. This study sought to identify and evaluate factors that influence cognitive engagement in learning nursing theory content.

Independent Study Behaviors

The previous section discussed cognitive self-regulated learning strategies. Higher education research has established the use of such strategies by students to process information presented in the classroom learning environment. The paradigm shift that is occurring in nursing education places a greater emphasis on collaborative partnerships and the development of lifelong learning practices. Therefore, nursing students are expected to take a greater responsibility for processing newly presented information inside and outside of the classroom setting. As evidenced by the lack of empirical research, the cognitive self-regulated learning approaches used by pre-licensure baccalaureate millennial nursing students is not well understood. The quality of effort a student devotes to processing new classroom content may be reflected in the number of hours he/she devotes to studying. Therefore, a variable of interest for this study was the relationship between independent study behaviors and student's use of cognitive self-regulated learning strategies. Research in nursing education and higher education has begun to illuminate the relationship between study behaviors, cognitive self-regulated learning strategy use, and academic success.

Nursing education research suggests a relationship may exist between the number of hours students spend studying per week and the cognitive self-regulated learning strategy of elaboration. In the previously discussed study by Mullen (2007) the number of hours spent

studying per week was significantly associated with the use of elaboration ($F(6, 102) = 3.64$, $p < 0.01$). However, it is interesting to note the authors also concluded time spent studying approached significance in association with the use of rehearsal ($F(6, 102) = 2.50$, $p < 0.05$). The majority of participants (75% of third trimester group and 55% of second trimester group) reported up to 20 hours studying independently per week. These findings support the belief that use of self-regulated learning strategies requires student awareness or metacognition of his/her learning needs (Pintrich & DeGroot, 1990). The student's use of study time may reflect his/her perceptions of appropriate behaviors needed for goal attainment. However, as previously noted use of a convenience sample of students from a single accelerated nursing program limits the generalizability of the results. In addition, one must question the influence of the participants' previous health care experience and baccalaureate degrees when interpreting the findings.

Likewise, higher education research investigating the relationship between time spent studying and test scores identified the cognitive self-regulated learning strategy of organization as an influential factor (Dickinson & O'Connell, 2001). A convenience sample ($N = 113$) of undergraduates enrolled in a learning principles and classroom management course completed self-monitoring activities. The students logged the amount of time they spent studying, reviewing, and organizing course material. The students' average study time was based on minutes per week. The time spent organizing had a stronger relationship with test scores ($r = .43$, $p < .001$) than total study time ($r = .25$, $p < .01$), and time spent reviewing ($r = .17$, $p < .05$). High scoring students averaged 32 minutes more per week organizing than low-scoring students. The authors concluded the quality of study time had a stronger influence on test scores than the quantity of study time. The findings suggest increased test scores resulted from the time spent organizing material; not the total amount of time spent studying the material. However, the use

of a convenience sample limits the generalizability of the findings. In addition, the participants self-reported both the number of study hours and the type of study activity (reading, reviewing, organizing) completed. Therefore, the possibility of social-response bias must be acknowledged.

Summary

The presented research provides limited insight into the relationship between study behaviors, cognitive self-regulated learning strategy use, and academic success. In addition, the use of convenience samples and different data collection procedures further limits the interpretation of the stated conclusions. The inconsistencies noted between total number of study hours and use of cognitive self-regulated learning strategies highlights the need for additional research. Before nurse educators can promote a shared responsibility for learning, exploration of the nursing student's approach to processing content outside of the classroom is needed.

The pre-licensure baccalaureate millennial nursing student's use of study time may reflect his/her perceptions of appropriate behaviors needed for goal attainment. The nurse educator must have awareness of such perceptions to understand how the nursing student perceives, interacts, and responds to the environment in which their learning occurs. This study sought to identify the relationship between independent study behaviors and cognitive self-regulated learning strategies used by pre-licensure baccalaureate millennial nursing students. Identification of a relationship may enable the nurse educator to assist the nursing student in developing effective independent study behaviors that will encourage higher-level competency based decision making skills.

Motivated Strategies for Learning Questionnaire

One tool that provides a measurement of self-regulated learning strategy use is the MSLQ. This tool is a paper and pencil self-report questionnaire designed to assess motivational

orientations and self-regulatory strategy use in academic settings (Pintrich et al., 1991). The MSLQ was developed following a social cognitive perspective of motivation and approaches to learning. This measurement tool assumes that the students actively process information and their beliefs and cognitions influence academic behaviors (Duncan & McKeachie, 2005). The MSLQ contains 81 items that comprise two main scales: motivation and learning strategies. The two main scales consist of 15 subscales. These scales can be used together or separately. Students respond to the items by rating themselves on a 7-point Likert Scale (1 = not at all true of me, 7 = very true of me). Scales are scored by taking the mean of the items that comprise the scale. High scores indicate greater levels of the construct of interest (Duncan & McKeachie, 2005).

The MSLQ has been subjected to various statistical and psychometric analyses. Such tests include internal reliability coefficient computation, factor analyses, and correlations with academic performance (Duncan & McKeachie, 2005). Cronbach's alpha coefficients for individual subscales range from .52 to .93 (Pintrich et al., 1991). The MSLQ was designed to be used at the course level. Therefore, norms have not been developed for this instrument. Thus, students' responses to the questions might vary as a function of different courses. Depending on the course, the same individual could report different level(s) of motivation or strategy use (Duncan & McKeachie, 2005).

For this study one motivation subscale (self-efficacy) and three learning strategy subscales (rehearsal, elaboration, and organization) was used. As previously discussed in the section related to cognitive self-regulated strategy use, four of the presented studies (Bandalos, et al., 2003; Mullen, 2007; Vanderstoep et al., 1996; Zusho & Pintrich, 2003) used the MSLQ. Each of the studies used the tool to assess motivational orientations and/or use of self-regulated learning strategies of students enrolled in higher education. The reported Cronbach's alpha

coefficients of the reviewed studies were similar to those originally reported by the authors of the tool (learning strategy subscales = 0.50 to 0.84; self-efficacy scale = .75 to .81). The established reliability of the MSLQ suggests this tool was appropriate to use to measure the variables of interest for this study.

Chapter Summary

This chapter provided a review of the conceptual framework for this study, social cognitive theory. The role of self-regulation in learning and cognitive engagement was defined. The significance of self-efficacy as a motivational construct was discussed. In addition, a critique of the literature related to cognitive self-regulated learning strategies and independent study behaviors was presented. The limitations of the studies were identified, and the need for further research was presented. Chapter Three describes the methodology of this study.

CHAPTER THREE

METHODOLOGY

This chapter describes the methods that were used in this research study. This chapter begins with a discussion regarding the study design. A description of the setting and sample, instrument, and procedures is included. This chapter concludes with a discussion regarding data analysis.

Design

As previously discussed, this study sought to examine (a) the use of cognitive self-regulated learning approaches by senior-level pre-licensure baccalaureate millennial nursing students and (b) the relationship between cognitive self-regulated learning approaches, self-efficacy, independent study behaviors, and grade point average. Therefore, a quantitative descriptive correlational design was used for this study. This approach is useful for describing the relationships among variables (Polit & Beck, 2012).

Setting and Sample

The setting selected for this study was a large state university in western Pennsylvania. This study used a convenience sample of pre-licensure baccalaureate millennial nursing students enrolled at this academic institution. Criteria for participant selection included senior-level academic class standing and enrollment in a nursing theory course during the Fall 2013 semester. All participants were 18 – 32 years of age. This range reflects the millennial generation as defined in the literature (Howe & Strauss, 2000). Individuals younger than 18 and older than 32 years of age were excluded from this study. There was no restriction to gender. Participation in this study was voluntary. All students who met the criteria were invited to participate in this study.

A power analysis was completed to estimate the required sample size for a correlation study. The conventional standards specify a 5% level of significance and power of .8 for determining sample size (Cohen, 1992). A common range of effect sizes for nursing studies is .20 to .40 (Polit & Beck, 2012). Following these guidelines, the power analysis results indicated a sample size of 62 participants was necessary to detect a medium effect size (r = .35) with high probability (power = .80) and a 5% level of significance (Polit & Beck, 2012). A total of 67 students met the inclusion criteria and were eligible to participate in this study. The final sample size consisted of 65 participants.

Instrument

This study used the Motivated Strategies for Learning Questionnaire (MSLQ). This tool is a self-report paper questionnaire designed to assess motivational orientations and self-regulated strategies used by students enrolled in higher education (Pintrich et al., 1991). The MSLQ is available via an open source journal thereby suggesting open use of the tool. The MSLQ contains 81 items that comprise two main scales: motivation and learning strategies. The motivation scale consists of 31 items that assess students' goals and value beliefs for a course, their beliefs about their skills to succeed in a course, and their anxiety about tests associated with a course (Pintrich et al., 1991). These items are further grouped into six subscales that evaluate intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety. The learning strategy scale contains 31 items addressing students' use of different cognitive and metacognitive approaches (Pintrich et al., 1991). These items are further grouped into five subscales that evaluate rehearsal, elaboration, organization, critical thinking, and metacognitive self-regulation. The learning strategy scale also includes 19 items regarding student management of different resources

(Pintrich et al., 1991). These items are further grouped into four subscales that evaluate time and study environment management, effort regulation, peer learning, and help seeking (Pintrich et al., 1991). The 15 subscales can be used together or separately. The focus of this study was factors that influence cognitive engagement in learning and academic success of pre-licensure baccalaureate millennial nursing students. The variables of interest included the motivational construct of self-efficacy and use of cognitive self-regulated learning strategies. Therefore for this study, one motivation subscale (self-efficacy, 8 questions) and three learning strategy subscales related to cognitive self-regulated strategies (rehearsal, 4 questions; elaboration, 6 questions; organization, 4 questions) of the MSLQ were used.

As previously discussed in Chapter Two, the MSLQ has been subjected to various statistical and psychometric analyses. This instrument was validated by the authors over several waves of data collection on almost 2,000 students enrolled in multiple higher education disciplines (Duncan & McKeachie, 2005). Psychometric testing by the authors revealed Cronbach's alpha coefficients for individual subscales ranging from .52 to .93 (Pintrich et al., 1991). Regarding the scales selected for this study, Cronbach's alpha coefficients were reported as .93 (self-efficacy), .69 (rehearsal), .76 (elaboration), and .64 (organization). Research previously discussed in Chapter Two (Bandalos et al., 2003; Mullen, 2007; Vanderstoep et al., 1996; Zusho & Pintrich, 2003) reported Cronbach's alpha coefficients similar to those originally reported by the authors of the tool. Ideally, Cronbach's alpha coefficients should be above .7 (DeVellis, 2003). However, with scales that have fewer than ten items (as is the situation with the subscales of rehearsal, elaboration, and organization) it is common to find Cronbach's values less than .7 (Pallant, 2010). The authors of the MSLQ confirmed internal reliability and factorial validity of the subscales through factor analysis and goodness-of-fit statistics. The authors

concluded through root mean square residual and Critical N index statistics that the model shows sound structures and good fit of observed to latent factors (Pintrich et al., 1991). For this study, Cronbach's alpha coefficients were calculated for each of the selected subscales: self-efficacy (.90), rehearsal (.66), elaboration (.70), and organization (.71). These results resemble previously published Cronbach's alpha coefficients, which support good internal consistency of the selected subscales.

As previously stated, this study used four subscales (22 items) of the MSLQ to measure the motivation construct of self-efficacy and the cognitive self-regulated learning strategies of rehearsal, elaboration, and organization (see Appendix A). The MSLQ was designed to be used at the course level. For this study, students were directed to respond to the items as they related to a specific nursing theory course. Students responded to the MSLQ items by rating themselves on a 7-point Likert Scale (1 = not at all true of me, 7 = very true of me). All items were positively worded. Subscales were scored by taking the mean of the items that comprised the scale. Therefore, scores could range from 1 to 7. High scores indicated greater levels of the construct being measured by the subscale (Duncan & McKeachie, 2005).

In addition to the MSLQ, participants answered five demographic questions created by this researcher. These items consisted of open-ended and multiple-choice formats. Participants were asked to provide information related to gender, age, and ethnicity. Data generated from these questions was used to describe the sample. Participants also addressed questions related to independent study behaviors and grade point average. Data generated from these questions was examined for effects on cognitive self-regulated learning strategy use. See Appendix A for the complete list of demographic items.

Procedures

Institutional Review Board approval was obtained prior to data collection. Access to the participants was gained through contacting the department chairperson of the nursing program at the identified institution. Contact information of the instructor who was assigned to teach the Fall 2013 nursing theory course was requested. The course instructor was contacted by this researcher. Before students could appropriately answer the survey, they must have completed their first exam in the nursing theory course. Therefore, an appropriate time was arranged when this researcher could visit the course to recruit study participants and administer the survey.

The course instructor was not present during recruitment and data collection. Students were provided a verbal overview of this research project and invited to participate by this researcher. The students were informed that participating in the study was voluntary and had no bearing on enrollment or course grade. Each student received a copy of the survey along with a cover letter (see Appendix B). The cover letter explained the aim of the study, risks and benefits of participating in the study, contact information of this researcher, and directions for an alternative activity if the student chose not to participate.

Each eligible student agreed to participate. Consent was implied when the student completed the survey. The survey took approximately 10 minutes to complete. All collected information was anonymous. This researcher explained to the participants that due to anonymity once the survey was submitted they would not be able to withdraw from this study. This researcher remained in the classroom during data collection to answer any questions related to this study. Students placed the surveys in a designated box that was collected by this researcher. Only completed surveys were analyzed. Surveys missing responses were destroyed. No incentives were used for this research.

Ethical Considerations

Subjects were under no obligation to participate in this study. Participation in this study had no bearing on the student's nursing theory course grade or enrollment at the academic institution. There were no known risks associated with completion of this study. Any form of information obtained during this study remained anonymous; including responses to the MSLQ and demographic information. All paper documents related to this study were kept secured in a locked filing cabinet. Electronic files were saved on a password protected computer. Both storage devices were only accessible to this researcher and dissertation committee members. Research data was reported in pooled form only.

Data Analysis

A code book was developed by this researcher for the coding of collected survey data. All coded data was entered by this researcher into a database. The collected data was analyzed with the use of the Statistical Package for the Social Sciences software, SPSS ® version 21. Prior to analysis, the data was visually screened for data entry errors. The following section discusses the statistical approach for analyzing demographic data and each research question.

Demographic Data

Descriptive statistics were used to organize and summarize the demographic data. Frequencies were computed for gender and ethnicity. Means, standard deviations, and ranges were computed for age, independent study behaviors, and grade point average.

Research Question One

Research question one asked which cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) senior-level pre-licensure baccalaureate millennial nursing students report using to understand content in a nursing theory course. Descriptive

statistics were computed to assess the distribution of each subscale score (rehearsal, elaboration, and organization). Mean scores and standard deviations for each subscale were computed and compared.

Research Question Two

Research question two explored the relationship between independent study behaviors and the cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students to understand content in a nursing theory course. Preliminary analysis of the data indicated a violation of linearity. Therefore, Spearman Rank Order Correlation (rho) values were computed to determine the direction and strength of each relationship. The level of significance for statistical analysis was $p < .05$.

Research Question Three

Research question three asked what the self-efficacy score was for senior-level pre-licensure baccalaureate millennial nursing students enrolled in a nursing theory course. Descriptive statistics were used to assess the distribution of the self-efficacy subscale scores. The mean score and standard deviation were computed and interpreted.

Research Question Four

Research question four explored the relationship between self-efficacy and the cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students to understand content in a nursing theory course. Preliminary analysis of the data indicated a violation of linearity. Therefore, Spearman Rank Order Correlation (rho) values were computed to determine the direction and strength of each relationship. The level of significance for statistical analysis was $p < .05$.

Research Question Five

Research question five explored the relationship between grade point average and the cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students. Preliminary analysis of the data indicated a violation of linearity. Therefore, Spearman Rank Order Correlation (rho) values were computed to determine the direction and strength of each relationship. The level of significance for statistical analysis was $p < .05$.

Chapter Summary

The purpose of this study was to expand the body of knowledge regarding factors that influence cognitive engagement in learning and academic success of senior-level pre-licensure baccalaureate millennial nursing students. This chapter reviewed the methodology for this study. A discussion regarding the rationale for a correlational study was presented. The setting and sample for this research was identified. The background of the MSLQ and application to this study was discussed. This chapter concluded with an overview of the statistical methods that were used to analyze the collected data. Chapter Four discusses the results yielded from this study.

CHAPTER FOUR

RESULTS

This chapter presents the results of the statistical analysis of this study's data set. This chapter begins with a description of the sample. Descriptive statistics that summarize gender, age, ethnicity, independent study behaviors, and grade point average are discussed. Data analysis pertaining to each research question is described. The cognitive self-regulated learning approaches used to understand content in a nursing theory course are reviewed. The self-efficacy score of the sample is identified. The relationship between independent study behaviors, self-efficacy, grade point average, and cognitive self-regulated learning approaches is examined.

Sample Description

The survey was administered to 67 students who met the inclusion criteria as discussed in Chapter Three. Two surveys had incomplete data and were not included in the analysis. Thus, the final sample size consisted of 65 students (97% of the eligible participants) who completed the entire survey. Demographic data that describes the sample is presented in Table 1. Of the 65 participants, 93.8% were female and 6.2% were male. The ages of the participants ranged from 19 to 30 years ($M = 21.9$, $SD = 1.44$) with most (81.6%) between the ages of 21 and 22. Minorities were minimally represented. Most of the participants (95.4%) were Caucasian. The characteristics of this study's sample resembles the national trends for gender, age, and ethnicity of pre-licensure nursing programs as reported by the NLN (2012).

Table 1

Demographic Characteristics of the Sample (N = 65)

Variable	n	%
Gender		
Female	61	93.8
Male	4	6.2
Age		
19	1	1.5
21	30	46.2
22	23	35.4
23	7	10.8
24	2	3.1
26	1	1.5
30	1	1.5
Ethnicity		
African American	3	4.6
Caucasian	62	95.4

Additional demographic information was collected regarding independent study behaviors and grade point average. The number of hours a week, outside of scheduled class time, studying for the nursing theory course ranged from 1 to 12 (M = 3.9, SD = 2.44). The majority of participants (83%) reported studying between 1 to 5 hours each week. Reported cumulative grade point average ranged from 2.80 to 4.0 (M = 3.4, SD = 0.30). Table 2 provides a detailed summary of these demographic variables.

Table 2

Frequency Distribution of Selected Demographic Variables

Variable	n	%
Independent		
Study Behaviors		
Hour(s)		
1	8	12.3
2	14	21.5
3	11	17.0
4	9	13.8
5	12	18.5
6	4	6.2
7	1	1.5
8	2	3.1
10	3	4.6
12	1	1.5
Grade Point Average		
2.80 – 3.00	7	10.8
3.01 – 3.24	13	20.0
3.25 – 3.49	14	21.5
3.50 – 3.74	19	29.2
3.75 – 4.00	12	18.5

Research Question One

Research question one asked which cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) do senior-level pre-licensure baccalaureate millennial nursing students report using to understand content in a nursing theory course. Descriptive statistics were computed to assess the distribution of each subscale score (rehearsal, elaboration, and organization). As previously discussed in Chapter Three, participants responded to items using a 7-point Likert Scale. Scores were computed by taking the mean of the items that comprised the scale. A score closer to 7 indicated greater use of the cognitive self-regulated

strategy. Ranges, mean scores, and standard deviations for each subscale are presented in Table 3. Mean scores indicated use of rehearsal (M = 5.1, SD = 1.17) and elaboration (M = 5.0, SD = 0.88) were slightly more true of the participants than use of organization (M = 4.8, SD =1.16).

Table 3

Descriptive Statistics for Cognitive Self-Regulated Learning Approaches Subscale Scores

Subscale	Items	Range	M	SD
Rehearsal	4	2 – 7	5.12	1.17
Elaboration	6	3 – 7	5.04	0.88
Organization	4	3 – 7	4.78	1.16

Research Question Two

Research question two explored the relationship between independent study behaviors and the cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students to understand content in a nursing theory course. The relationship between independent study behaviors and cognitive self-regulated learning approaches was investigated with the intention of using Pearson product-moment correlation coefficients. Preliminary analysis indicated the data did not meet the assumptions necessary for this statistical test. As illustrated in Figures 4, 5 and 6 the data violated the assumption of linearity. Therefore, Spearman Rank Order Correlation (rho) values were used for non-parametric testing. Data from the correlations is presented in Table 4. Results indicated a small positive significant relationship between independent study behaviors and the use of rehearsal ($r_s = .29$, $n = 65$, $p = .018$). There was a medium positive significant relationship between independent study behaviors and use of elaboration ($r_s = .43$, $n = 65$, $p < .0005$). Similar

findings resulted when examining the relationship between independent study behaviors and use of organization (r_s = .43, n = 65, p < .0005). These findings suggest more hours of independent study behaviors is associated with higher subscale scores of the cognitive self-regulated learning strategies of rehearsal, elaboration, and organization.

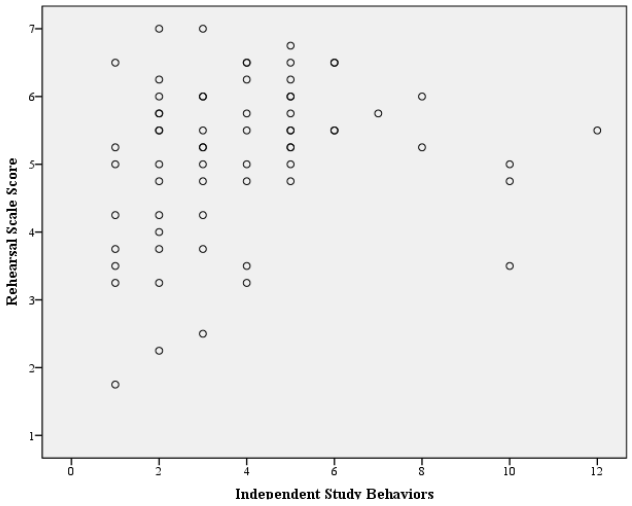

Figure 4. Scatterplot exploring the relationship between rehearsal and independent study behaviors. Rehearsal scale score is the calculated mean of the items that comprised the scale. Independent study behaviors is the reported number of hours spent study a week for the nursing theory course.

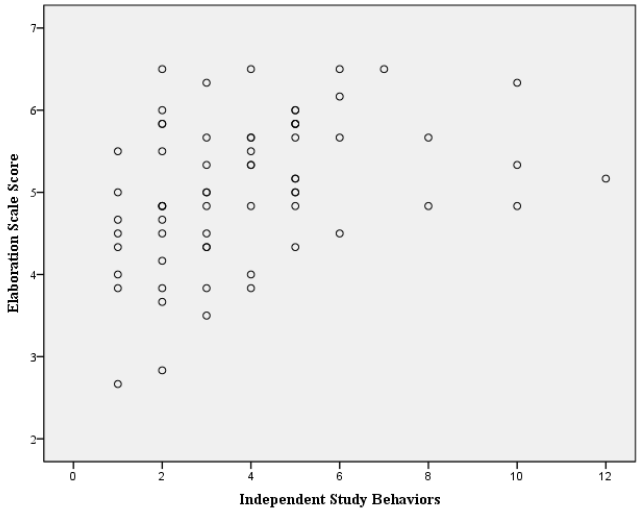

Figure 5. Scatterplot exploring the relationship between elaboration and independent study behaviors. Elaboration scale score is the calculated mean of the items that comprised the scale. Independent study behaviors is the reported number of hours spent study a week for the nursing theory course.

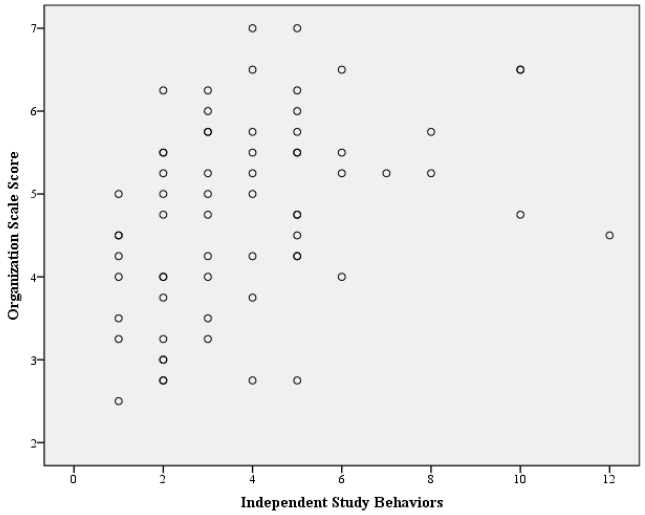

Figure 6. Scatterplot exploring the relationship between organization and independent study behaviors. Organization scale score is the calculated mean of the items that comprised the scale. Independent study behaviors is the reported number of hours spent study a week for the nursing theory course.

Table 4

Correlations for Independent Study Behaviors and the Cognitive Self-Regulated Learning Approaches (n = 65)

Subscale	Independent Study Behaviors (r_s)	p
Rehearsal	.293*	.018
Elaboration	.426**	.0005
Organization	.433**	.0005

Note: r_s = Spearman Rank Order Correlation (rho); Strengths of correlations: small (.10 – .29), medium (.30 - .49), and high (.50 – 1.0) (Cohen, 1988); * Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

Research Question Three

Research question three asked what is the self-efficacy score for senior-level pre-licensure baccalaureate millennial nursing students enrolled in a nursing theory course. Descriptive statistics were used to assess the distribution of the self-efficacy subscale scores. As previously discussed in Chapter Three, participants responded to items using a 7-point Likert Scale. Scores were computed by taking the mean of the items that comprised the scale. A score closer to 7 indicated the participant exhibited more of the cognitions related to self-efficacy. Results indicated expectancy for course success, and confidence in the ability to accomplish tasks related to the course were true of the participants (M = 5.0, self-efficacy range: 3–7, SD = 0.80).

Research Question Four

Research question four explored the relationship between self-efficacy and the cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students to understand content in a nursing theory course. The relationship between self-efficacy and cognitive self-regulated learning approaches

was investigated with the intention of using Pearson product-moment correlation coefficients. Preliminary analysis indicated the data did not meet the assumptions necessary for this statistical test. As illustrated in Figures 7, 8, and 9 the assumption of linearity was violated. Therefore, Spearman Rank Order Correlation (rho) values were used for non-parametric testing. Data from the correlations is presented in Table 5. Results indicated a non-significant relationship between self-efficacy and rehearsal ($r_s = .16$, $n = 65$, $p = .206$). Similar non-significant findings resulted when the relationship between self-efficacy and organization was examined ($r_s = .22$, $n = 65$, $p = .073$). Analysis revealed a small positive significant relationship between self-efficacy and elaboration ($r_s = .26$, $n = 65$, $p = .034$). Thus suggesting higher scores of the self-efficacy subscale associated with higher subscale scores of the cognitive self-regulated learning strategy of elaboration.

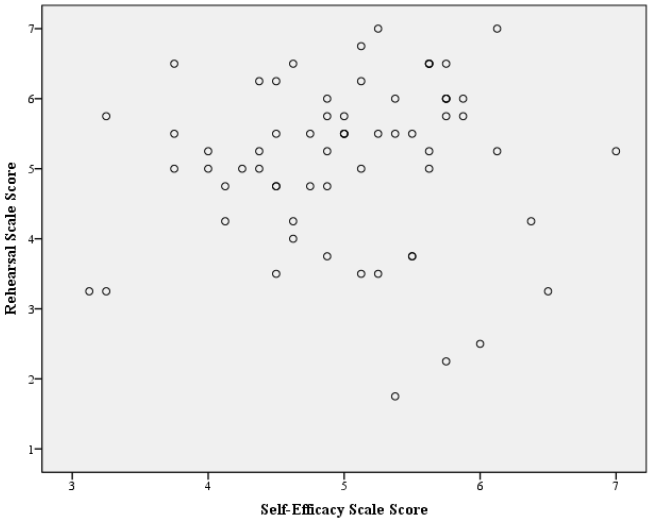

Figure 7. Scatterplot exploring the relationship between rehearsal and self-efficacy. Rehearsal scale score and self-efficacy scale score are the calculated means of the items that comprised the scales.

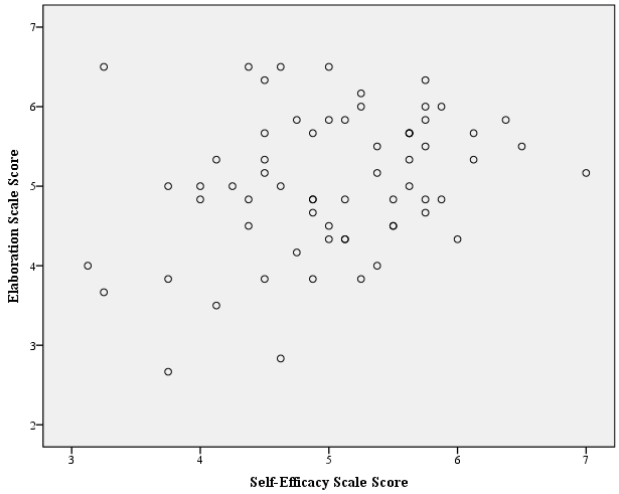

Figure 8. Scatterplot exploring the relationship between elaboration and self-efficacy. Elaboration scale score and self-efficacy scale score are the calculated means of the items that comprised the scales.

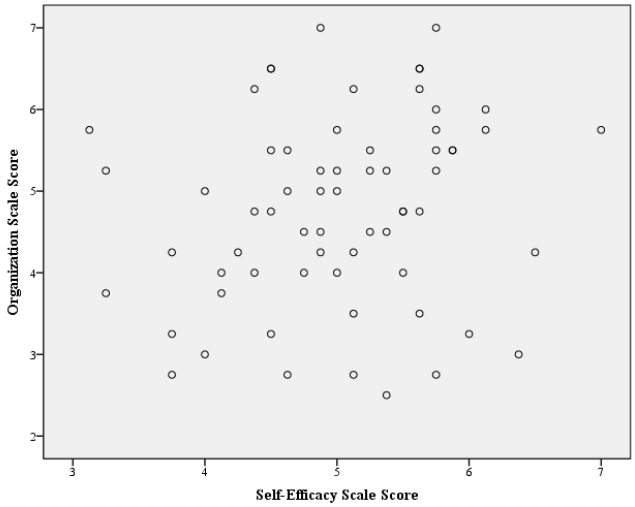

Figure 9. Scatterplot exploring the relationship between organization and self-efficacy. Organization scale score and self-efficacy scale score are the calculated means of the items that comprised the scales.

Table 5

Correlations for Self-Efficacy and the Cognitive Self-Regulated Learning Approaches (n = 65)

Subscale	Self-Efficacy (r_s)	p
Rehearsal	.159	.206
Elaboration	.263*	.034
Organization	.224	.073

Note: r_s = Spearman Rank Order Correlation (rho); Strengths of correlations: small (.10 – .29), medium (.30 - .49), and high (.50 – 1.0) (Cohen, 1988); * Correlation is significant at the 0.05 level (2-tailed).

Research Question Five

Research question five explored the relationship between grade point average and the cognitive self-regulated learning approaches (rehearsal, elaboration, and organization) used by senior-level pre-licensure baccalaureate millennial nursing students. The relationship between grade point average and cognitive self-regulated learning approaches was investigated with the intention of using Pearson product-moment correlation coefficients. Preliminary analysis indicated the data did not meet the assumptions necessary for this statistical test. As illustrated in Figures 10, 11, and 12 the assumption of linearity was violated. Therefore, Spearman Rank Order Correlation (rho) values were used for non-parametric testing. Data from the correlations is presented in Table 6. Results indicated no relationship between grade point average and rehearsal (r_s = .05, n = 65, p = .685). Exploration of the variables grade point average and elaboration indicated a non-significant relationship (r_s = .20, p = 65, p = .117). On the other hand, findings pertaining to grade point average and organization revealed a medium positive significant relationship (r_s = .31, n = 65, p = .013). This result suggests high grade point averages

associated with higher subscale scores of the cognitive self-regulated learning strategy of organization.

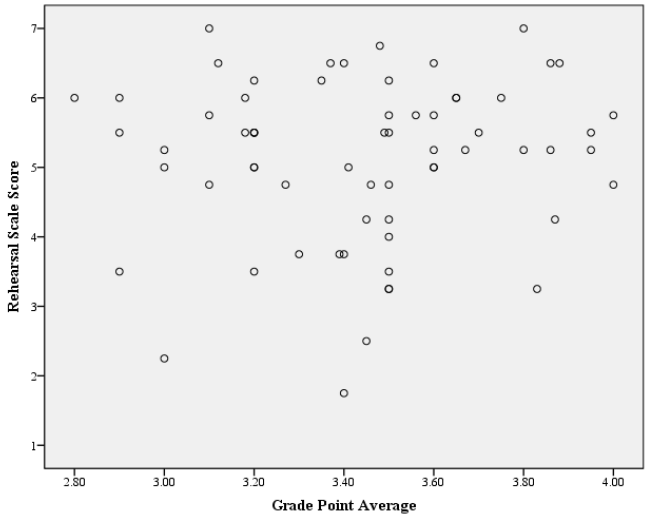

Figure 10. Scatterplot exploring the relationship between rehearsal and grade point average. Rehearsal scale score is the calculated mean of the items that comprised the scale. Grade point average is the reported cumulative grade point average.

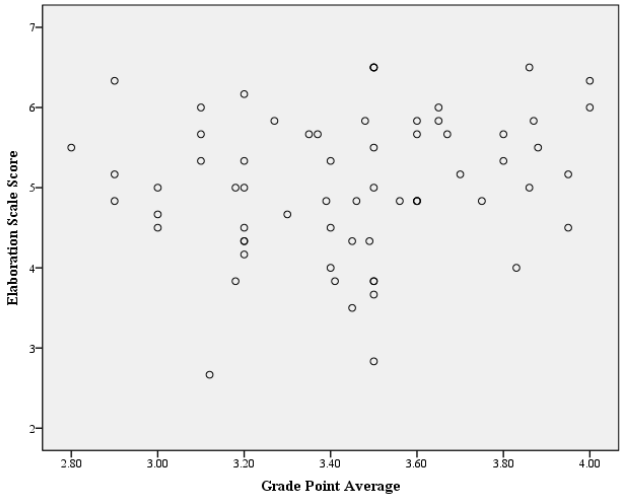

Figure 11. Scatterplot exploring the relationship between elaboration and grade point average. Elaboration scale score is the calculated mean of the items that comprised the scale. Grade point average is the reported cumulative grade point average.

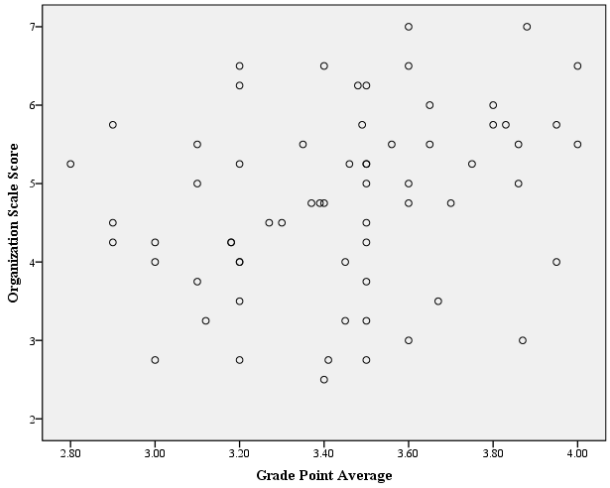

Figure 12. Scatterplot exploring the relationship between organization and grade point average. Organization scale score is the calculated mean of the items that comprised the scale. Grade point average is the reported cumulative grade point average.

Table 6

Correlations for Grade Point Average and the Cognitive Self-Regulated Learning Approaches (n = 65)

Subscale	Grade Point Average (r_s)	p
Rehearsal	.051	.685
Elaboration	.196	.117
Organization	.308*	.013

Note: r_s = Spearman Rank Order Correlation (rho); Strengths of correlations: small (.10 – .29), medium (.30 - .49), and high (.50 – 1.0) (Cohen, 1988); * Correlation is significant at the 0.05 level (2-tailed).

Chapter Summary

This chapter presented the statistical analysis of this study's data set. A description of the sample was provided. The cognitive self-regulated learning approaches used to understand content in a nursing theory course were reviewed. The self-efficacy score of the sample was identified. The relationship between independent study behaviors, self-efficacy, grade point

average, and cognitive self-regulated learning approaches was examined. The next chapter presents a discussion pertaining to this study's results, implications for nursing education, and recommendations for future research.

CHAPTER FIVE

DISCUSSION AND IMPLICATIONS

This chapter offers a discussion about this study's data. The results of each research question highlighted in Chapter Four are further explained and interpreted. These findings are also compared and contrasted to the literature, and when appropriate are discussed within the context of the conceptual framework used for this study. In addition, limitations of this study are identified. Implications for nursing education are addressed. This chapter concludes with recommendations for future research.

Discussion

This section presents a discussion of this study's findings. The areas discussed include the sample's demographic characteristics and use of cognitive self-regulated learning approaches. This section also discusses the relationships between independent study behaviors, self-efficacy, grade point average, and use of cognitive self-regulated learning approaches.

Demographic Characteristics

The demographic data analyzed for this study included gender, ethnicity, and age. Of the participants who completed the survey, 93.8% were female. When examining ethnicity, 95.4% of the participants reported being Caucasian. The ages of the participants were between 19 to 30 years, with most (81.6%) between the ages of 21 and 22. As previously identified in Chapter Four, the characteristics of this study's sample resemble the national trends for gender, ethnicity, and age generally seen in the nursing student population. The demographics of this study's sample was compared to the demographics of nursing students from the NLN (2012) survey of nursing students across program types for the academic year 2010 – 2011. As reflected in this study's sample, the NLN (2012) also reported a relatively low proportion (16%) of males and

minorities (24%) enrolled in pre-licensure nursing programs. Similar to the participants' ages noted in this study, the NLN (2012) also found most (86%) students who were enrolled in pre-licensure baccalaureate nursing programs were under 30 years of age. In addition, the age of the participants in this study also reflect the age of the millennial generation as defined by Howe and Strauss (2000). Further exploration of generational characteristics was not employed for this study. However, an underlying assumption of this study was participants displayed the generational characteristics and preferences of millennials as discussed in the literature (Howe & Strauss, 2000; Gibson, 2009; Johanson, 2012; Mangold, 2007; McCurry & Martins, 2010; Pardue & Morgan, 2008; Walker et al., 2006).

Cognitive Self-Regulated Learning Approaches

Research question one sought to identify the cognitive self-regulated learning approaches senior-level pre-licensure baccalaureate millennial nursing students report using. Students in this study reported the use of rehearsal, elaboration, and organization was true of them when surveyed during week seven of a 15 week course. This was indicated by the mean subscale scores being close to 7 on a 7-point Likert Scale (rehearsal M = 5.1; elaboration M = 5.0; organization M = 4.8). While students reported the use of all three strategies to understand content in a nursing theory course, students reported the use of rehearsal and elaboration slightly more than organization. This finding is partially inconsistent with the previous research discussed in Chapter Two. Zusho and Pintrich (2003) concluded rehearsal was the main approach used by students when surveyed at the middle of a course. Use of deeper processing strategies (e.g., elaboration and organization) were not evident until students were resurveyed at the end of the course. Similar conclusions were made by Severines et al. (2001) from students surveyed at the beginning and end of an academic year. Mullen's (2007) research further

supports the belief that use of complex cognitive self-regulated learning strategies result from content exposure during course and program progression.

Results of this research concur with the argument presented by Pintrich and DeGroot (1990) and Bandura (1986). A student's use of cognitive self-regulated learning strategies should be viewed as a continuum in which the student demonstrates varying degrees of self-regulated behaviors. As denoted by the mean subscale scores of this study, students' cognitive self-regulated learning strategy use was relatively equal for all three strategies. Thus, suggesting a reciprocal process may be involved in the understanding and application of course content. For example, a student may be exposed to new or unfamiliar material throughout the length of a course. The use of rehearsal would be the appropriate initial approach for processing the new complex material (Duncan & McKeachie, 2005). As the cognitively engaged student's understanding of new course content develops, he / she would employ more complex strategies to increase his / her understanding of the material (Linnenbrink & Pintrich, 2003). Hence, as highlighted in this study's findings the continued use of rehearsal may be necessary to advance the student's understanding of content throughout the delivery of a course.

While the possibility of a cyclic process is interesting, the timing of survey administration in this study should be taken into consideration. Perhaps the assumed reciprocal process is actually a representation of the students transitioning from simple to complex cognitive self-regulated learning strategy use. The inference may be drawn that senior-level pre-licensure baccalaureate millennial nursing students would predominately use deeper cognitive self-regulated learning strategies as they progressed through the course. Thus, supporting the conclusions made by previous authors (Mullen, 2007; Severines et al., 2001; Zusho & Pintrich,

2003). Re-surveying the same group of students at the end of the semester would allow for further exploration of this phenomenon.

The findings of this study related to cognitive self-regulated learning approaches contrasts with previously published literature. The assumption that use of deeper processing strategies is the result of greater exposure to course and program content should be cautiously made. The possibility of a cyclic process existing with cognitive self-regulated learning strategy use, as suggested in this study, warrants further exploration.

Independent Study Behaviors

Research question two explored the relationship between independent study behaviors and use of cognitive self-regulated learning approaches. Descriptive statistics revealed the number of hours spent studying a week for the nursing theory course ranged from 1 to 12 (M = 3.9). Most of the students (83%) reported studying for the course between 1 to 5 hours a week. Further statistical analysis indicated a small positive significant relationship existed between independent study behaviors and the use of rehearsal ($r_s = .29$, n = 65, p = .018). A medium positive significant relationship existed between independent study behaviors and use of both elaboration ($r_s = .43$, n = 65, p = .0005) and organization ($r_s = .43$, n = 65, p = .0005). These results suggest an increase in study time was associated with the use of both basic (e.g., rehearsal) and complex (e.g., elaboration and organization) cognitive self-regulated learning strategies. Pintrich and DeGroot (1990) propose the use of cognitive self-regulated learning strategy use requires student awareness or metacognition of his / her learning needs. Through self-reflection and self-judgment the student regulates his / her actions, sets goals, and implements a course of action that is likely to produce positive outcomes (Bandura, 1991; Bandura, 2001). Thus, a student's use of study time may reflect his / her perceptions of

appropriate strategy use for understanding and applying course content. In relation to the previously discussed findings of this study, the suggested positive relationships are not surprising. These results further illustrate the possibility of either a reciprocal relationship existing, or the transitioning of students from simple to complex cognitive self-regulated learning strategy use.

Results of this study reflect findings similar to the research discussed in Chapter Two. Mullen (2007) also concluded time spent studying per week was significantly associated with a higher subscale score of elaboration. In comparison to this research, Mullen (2007) did not identify any relationship between time spent studying and use of rehearsal or organization. A possible explanation for the inconsistencies may be the differing characteristics of the study population. This study's population of interest was senior-level pre-licensure baccalaureate millennial nursing students. Whereas in the comparison study, the focus was students from multiple generations enrolled in an accelerated baccalaureate nursing program. Therefore, it is possible a student's use of cognitive self-regulated learning strategies during study time may be influenced by the internal factor of generational preferences. In addition, the student's in the Mullen (2007) study already attained a previous degree. Perhaps the internal factor of previous successful learning experiences may explain why a significant relationship with rehearsal was not identified by Mullen (2007). The use of a deeper processing strategy requires a basic understanding of the presented content. It is possible knowledge gained through a previously completed degree may assist the student in relating new information to previously acquired knowledge. Thus, the use of a basic cognitive self-regulated learning strategy (e.g., rehearsal) would not be needed during study time.

Further impacting the difference in research findings may be the definition of independent study behaviors. For this research, reported hours spent studying were linked to a specific nursing theory course. Mullen (2007) viewed this variable in more general terms as hours spent studying on all course work per week. Bandura (1986) purports self-regulated behaviors result from the reciprocal influence of both internal and external factors. The use of cognitive self-regulated learning strategies is situational, content specific, and varies between activities. As discussed in the previous chapters, cognitive self-regulated learning strategy use may be influenced by course logistics, course assignments, pedagogical methods, and evaluation practices (Berry, 2009; McCurry et al., 2001; Strang et al., 2010; Vanderstoep et al., 1996). Therefore, exploration of this variable in general terms does not account for the influence of the external factor of a specific learning environment. While this study did not assess any of these course specific variables, the findings of this research do support the need for further exploration.

Further discussion about these findings is limited. The literature presented in Chapter Two identified the lack of research on this topic. Therefore, it is difficult to come to a conclusion regarding the relationship between independent study behaviors and cognitive self-regulated learning strategy use. Additional research is needed in this area to be able to draw accurate conclusions.

Self-Efficacy

Research question three sought to identify the self-efficacy score of senior-level pre-licensure baccalaureate millennial nursing students enrolled in a nursing theory course. Research question four explored the relationship between self-efficacy and use of cognitive self-regulated learning approaches. Descriptive statistics revealed relatively high levels of perceived self-efficacy among the students. This was illustrated by the mean subscale score being close to 7 on

a 7-point Likert Scale (M = 5.0). Results suggest students believed they could successfully complete the course and associated tasks when surveyed during week seven of the 15 week course. Further statistical analysis indicated a significant relationship only existed between self-efficacy and elaboration ($r_s = .26$, $n = 65$, $p = .034$). Results of this study suggest increased self-efficacy beliefs were associated with the use of a deeper processing strategy. In the previously discussed research of Zusho and Pintrich (2003), the authors also propose a relationship may exist between increased self-efficacy and the use of complex cognitive self-regulated learning strategies. Duncan and McKeachie (2005) concur that students with high self-efficacy tend to use deeper processing strategies compared to students with less adaptive motivational beliefs.

The findings of this study are not surprising when placed in context with the conceptual understanding of self-efficacy as an internal motivational construct. Bandura (1977) describes self-efficacy as an individual's personal judgment of his / her capabilities to organize and execute courses of action to achieve identified goals. Students with a strong degree of self-efficacy undertake challenging tasks and adjust to the learning environment to promote their academic success (Chemers et al., 2001). The results from this study further support the belief that highly efficacious students employ select complex cognitive self-regulated learning strategies to process and apply course content. However, further inferences to be drawn from this conclusion are limited. A significant relationship was only suggested between self-efficacy and one of the two deep processing strategies. Consideration should be given to possible explanations for this finding. Self-efficacy is viewed as situational, task dependent, and influenced by various factors. As previously discussed, nursing education research supports the belief that mastery experiences, vicarious experiences, and supportive feedback positively impacts a student's perceived level of self-efficacy (Goldenberg et al., 2005; Sinclair &

Ferguson, 2009). In contrast, experienced failures lower an individual's perception of self-efficacy and results in avoidance behaviors (Bandura, 1977). Therefore, the finding of an insignificant relationship between self-efficacy and organization in this study may have resulted from an unsuccessful past experience. Literature supports the belief that a student's use of a complex processing strategy before the development of a basic understanding of content may lead to his / her confusion and unsuccessful goal attainment (Bandalos et al., 2003). Thus, the student's level of perceived self-efficacy decreases and future use of the strategy is avoided.

The influence of pedagogical methods and timing of survey administration may be other plausible explanations for this study's findings. This study recruited participants from one nursing theory course. The survey was administered during week seven of the course. The methods used by the instructor up to that time may have encouraged the use of strategies related to elaboration (e.g., paraphrasing and summarizing) and not organization (e.g., outlining and diagramming). The possibility exists that a significant relationship may have resulted if students were also exposed to learning activities that required the use of organization. As discussed in Chapter Two, the influence of pedagogical methods on a student's level of perceived self-efficacy is not well understood. This study did not seek information from the instructor regarding pedagogical methods used. In addition, the students were only surveyed during one time point in the course. Therefore, only a superficial conclusion regarding the potential influence of teaching and learning activities can be made.

As identified in Chapter Two, exploration of self-efficacy as a motivational construct is limited in nursing education. The results of this study provide insight regarding the relationship between self-efficacy and elaboration. However, exploration of additional mediating variables is

needed. Research regarding the influence of past learning experiences and pedagogical methods may provide useful information.

Grade Point Average

Research question five explored the relationship between grade point average and use of cognitive self-regulated learning approaches. Descriptive statistics revealed the cumulative grade point average ranged from 2.80 to 4.0 (M = 3.4). Further statistical analysis indicated a positive significant relationship only existed between grade point average and the use of organization ($r_s = .31$, $n = 65$, $p = .013$). Results of this study suggest high grade point averages were associated with the increased use of a deeper processing strategy. This finding reflects the self-directed processes involved in self-regulated learning. The self-regulated student who is cognitively engaged in the learning process is able to differentiate between facts and skills they do or do not know and possess (Zimmerman, 1990). He / she is able to assess the academic task, set goals for studying, and implement appropriate learning approaches to promote academic success (Hadwin et al., 200; Pintrich, 2004; Zimmerman, 2008). As suggested in this study's findings, the literature supports the use of organization results in better performance (Pintrich et al., 1991; Vanderstoep et al., 1996). The use of this strategy involves selecting the main ideas of newly learned information, and identifying the connections between information learned in different contexts. Through use of organization a student is able to identify what additional information he / she needs to learn to be successful in the course (Pintrich et al., 1991).

The findings of this research contradict the literature presented in Chapter Two. Balch (2001) along with Heikkila and Lonka (2006) concluded only approaches related to elaboration were significantly correlated with academic success. However, it is important to note the reported correlations from both studies denoted relatively weak relationships. The cognitive

self-regulated learning strategy of elaboration is considered a deep processing approach. Use of this strategy allows the student to connect new knowledge with prior knowledge. However, unlike organization the literature does not support that the use of elaboration promotes the student to identify what additional knowledge must be gained to be successful in a course. The inconsistencies in conclusions may have resulted from differences in the data collection procedures. Each study used a different instrument to measure cognitive self-regulated learning strategy use. The possibility exists each survey's definition of the strategies was different. Therefore, findings between the studies should be cautiously compared due to varying perceptions of what characteristics define the strategies of elaboration and organization.

Also impacting the differences in research findings may be the definitions of academic success. Similar to the international study completed by Heikkila and Lonka (2006), this study defined academic success as a student's cumulative grade point average in university studies. Whereas, Balch (2001) measured performance as total points earned in a specific introductory psychology course. The varying definitions of academic success introduce numerous internal and external factors that may have further contributed to each study's results. For example, further consideration should be given to the contextual factors the students may have been exposed to at their academic institutions. Furthermore, one cannot infer that educational practices involving curriculum policies and evaluative methods were similar at each of the study's sites.

The differences in each study's population of interest may be another possible explanation for the inconsistencies in the results. The participants of both of the comparison studies were non-nursing students. Literature supports the use of specific cognitive self-regulated learning strategies may be associated with particular academic disciplines

(Vanderstoep et al., 1996). Therefore, further limiting the possibility of making accurate conclusions is the unknown influence of discipline specific course requirements, assignments, and evaluation methods. Thus, further consideration should be given to potential differences in cumulative grade point average in university studies versus cumulative grade point average in nursing courses.

As evidenced by the literature presented in Chapter Two, nursing education lacks empirical research addressing the use of cognitive self-regulated learning strategies and academic success. The results of this study suggest a relationship exists between academic success and use of organization. However, additional studies that replicate such findings are warranted before further conclusions can be supported.

Limitations

There were several limitations of this study. The first limitation involves the use of a convenience sample. This study recruited senior-level pre-licensure baccalaureate millennial nursing students enrolled in a specific nursing theory course at one academic institution. Therefore, the findings of this study may have limited generalizability and may only pertain to a certain geographical area. The millennial students who participated in this study may have different generational characteristics than the entire population of interest. In addition, one cannot infer that curriculum policies and evaluative methods at the study site are similar to educational practices in all baccalaureate nursing programs. Furthermore, the identified cognitive self-regulated learning strategies used by the students in this study only pertain to one specific nursing theory course. One cannot assume the same student would use a similar approach for all courses in which he / she is enrolled.

Another limitation was the use of a self-reported survey. Use of this type of survey may have introduced the possibility of exaggeration by the participants. Students may have structured their responses in a manner they felt was most acceptable or desirable of this researcher. This may have resulted in the inflation of survey responses related to cognitive self-regulated learning strategy use, self-efficacy, grade point average, and independent study behaviors.

Timing of survey administration was another limitation. Data was collected near the midpoint of the course. The course topics (e.g., new content versus a review of previously learned content) that were covered during the timeframe before survey administration may have influenced the use of specific cognitive self-regulated learning strategies. Furthermore, the pedagogical methods, course assignments, and evaluative methods the students experienced in the course may have also influenced survey responses. Thus, these factors may have resulted in under-reporting or over-reporting of the use of certain cognitive self-regulated learning strategies.

Implications

The purpose of this study was to identify factors that influence cognitive engagement in learning and academic success of senior-level pre-licensure baccalaureate millennial nursing students. The results of this study offer nurse educators insight into the way these students perceive, interact, and respond to the environment in which their learning occurs. This study's results suggest senior-level pre-licensure baccalaureate millennial nursing students use both basic (e.g., rehearsal) and complex (e.g., elaboration and organization) cognitive self-regulated learning approaches to process and apply course content. Based on these findings, faculty should not dismiss the importance of a student's use of rehearsal when planning and implementing learning activities and evaluative methods in a course. A student may respond poorly to

educational methods that require the use of a deep processing strategy before he / she has developed a fundamental understanding of content. A student must have basic knowledge of course material before he / she is able to synthesize information, link concepts, and think critically. Therefore, nurse educators should consider implementing student-centered instructional methods in a logical sequence that first promote the development of a conceptual understanding of course content. Furthermore, this suggestion also applies to curriculum development. Faculty should assess the structure of a nursing program curriculum for the progression of concepts from basic to complex. As a student progresses through a nursing program he / she should be encouraged to continuously build on and apply previously gained knowledge to newly presented material. Course sequencing not supporting this progression may ultimately impact a student's ability to link and apply theoretical concepts to the practice environment.

The use of student-centered methods requires a collaborative partnership between the faculty and nursing student in which the responsibility for learning is shared (Brandon & All, 2010; Levett-Jones, 2005; Patterson et al., 2002). Nursing students are expected to take accountability for processing newly presented information inside and outside of the classroom setting. Results from this study suggest a student's use of study time may reflect his / her perceptions of appropriate strategy use for understanding and applying course content. Therefore, a student may only use the cognitive self-regulated learning strategies he / she was encouraged to use in the classroom when studying course material. Nurse educators should be cognizant of this relationship when structuring course content. As students progress through a course they should be exposed to course assignments, pedagogical methods, and evaluative practices that promotes the transitioning from simple to complex cognitive self-regulated

learning strategy use. Encouraging the use of deeper processing strategies may better equip students with the skills needed for the complex health care environment and lifelong learning practices.

The internal motivational construct of self-efficacy further influences a student's use of complex cognitive self-regulated learning approaches. Results of this study suggest highly efficacious students employ the deep processing strategy of elaboration. Nurse educators should focus attention on the influence of a student's perceptions when facilitating learning in the classroom environment. Designing and implementing student-centered methods that promote mastery and vicarious experiences with course content may positively impact a student's perceived level of self-efficacy. In addition, offering supportive feedback when encouraging the use of additional complex (e.g., organization) cognitive self-regulated learning strategies may increase a student's belief he / she can successfully use both approaches. The student may then be encouraged to apply greater effort in processing and applying course content and pursue more complex goals. Successful completion of complex goals may aid in the student's development of higher-level competency based decision making skills. Thus, the student will be able to synthesize information, link concepts, and translate newly gained knowledge into practice.

The association between academic success and complex cognitive self-regulated learning strategies further illustrates the importance of these approaches. Findings from this study suggest students with high grade point averages use the deep processing strategy of organization. Through use of this strategy a student is able to identify, implement, and evaluate the learning approaches needed for successful academic outcomes. Therefore, nurse educators should be aware of a student's learning needs and promote a supportive, collaborative, and cohesive learning environment. This may enhance the efficient use of classroom and study time. Student-

centered strategies that encourage experiential learning and group interactions may promote cognitive engagement and knowledge acquisition of the student (Berry, 2009; Gibson, 2009; Johanson, 2012; Mangold, 2007; McCurry & Martins, 2010; McCurry et al., 2011; Strang et al., 2010). Students who are cognitively engaged in learning demonstrate academic motivation and persistence towards degree completion (McGlynn, 2007; Notarianni et al., 2009). Thus, supporting the use of organization within and outside of the classroom environment may produce a diverse cohort of skilled professionals and lifelong learners that will replenish the nursing workforce.

The findings of this research illuminate the nurse educator's role in fostering cognitive engagement and promoting academic success. Therefore, faculty should be encouraged to increase their own understanding and awareness of students' cognitive self-regulated approaches to learning. Nursing programs should encourage and initiate opportunities for faculty to explore, share, discuss, and professionally grow in their understanding of supportive strategies (e.g., student-centered activities, evaluative methods, content sequencing) to implement in the learning environment. Collaborative efforts between faculty involved in all levels of a nursing program is essential for retaining and graduating students who are prepared to meet the complex requirements of the health care environment.

Recommendations

The findings of this study offer recommendations for faculty, administrators, and future research. The results of this study support the need for nurse educators to evaluate the curriculum structures of pre-licensure baccalaureate nursing programs. Sequencing courses following the progression of basic to complex concepts may encourage the development of higher-level competency based decision making skills. The results of this research also support

the need for nurse educators to evaluate the educational approaches implemented in the classroom learning environment. Presenting course content following a logical progression may support a student's transitioning from simple to complex cognitive self-regulated learning strategy use. In addition, implementing pedagogical and evaluative methods that promote the synthesizing and analysis of information may encourage a student to employ the same approaches when studying course content outside of the classroom setting. Furthermore, the results of this study support the need for nurse educators to broaden their understanding of the influence of a student's perceptions on cognitive self-regulated learning strategy use and academic success. Creating a supportive collaborative environment in which feedback is offered may encourage a student to apply greater effort in processing and applying course content.

In light of this study's findings, additional research is needed to further explore factors that influence cognitive engagement and academic success of pre-licensure baccalaureate millennial nursing students. Future research should use methods beyond the descriptive approach. Attempts should be made to recruit participants from different baccalaureate programs enrolled in various nursing courses. This would ensure a more diverse population for comparison.

This study identified the possibility of a reciprocal process being involved in a student's use of cognitive self-regulated learning strategies. However, one cannot adequately conclude based on this study's results if the process exists, or if timing of survey administration captured the students transitioning from simple to complex strategy use. Therefore, to further explore this phenomenon future studies should re-survey the same group of students at different time points throughout the delivery of a course.

Limited nursing education research exists on the topic of independent study behaviors and use of cognitive self-regulated learning strategies. This study revealed a positive relationship existed between increased study hours and use of both simple and complex strategies. However, possible external factors that may have influenced these findings were not accounted for. For example, structure of the learning environment, sequencing of course topics, use of student-centered activities that encouraged experiential learning and group interactions, and timing and type of feedback offered in the course. Therefore, additional research should assess the influence of course specific variables. Exploration of course logistics, course assignments, pedagogical methods, and evaluative practices in relation to independent study behaviors and strategy use may provide valuable information.

The influence of self-efficacy as a motivational construct is not well understood in nursing education. This study provides insight regarding the influence of self-efficacy on a student's use of cognitive self-regulated learning strategies. This study suggests highly efficacious students employ select complex cognitive self-regulated learning strategies when processing and applying course content. While this finding reflects the conceptual characteristics of self-efficacy, further inferences to be drawn are limited. Future studies should include the examination of past learning experiences and pedagogical methods. This may provide information regarding mediating factors that influence the effects of self-efficacy as a motivational construct.

Nursing education lacks empirical research addressing academic success and use of cognitive self-regulated learning strategies. The findings of this study provide a basic understanding of this topic. The results propose a positive relationship existed between academic success and one of two complex cognitive self-regulated learning strategies. Given

this finding both supports and contradicts higher education literature highlights the need for additional research. The differences elude to the possibility that discipline specific internal and external factors may impact academic success and the use of deeper processing strategies. Future research should measure the influence of contextual factors that may play a role in the assumed relationship. Collecting data about curriculum policies and evaluative methods may further illuminate the relationship between academic success and the use of cognitive self-regulated learning strategies.

Conclusions

This study sought to expand the body of knowledge on factors that influence cognitive engagement and academic success of pre-licensure baccalaureate millennial nursing students. The findings of this study provide nurse educators with foundational knowledge regarding students' use of cognitive self-regulated learning strategies, and the relationships between strategy use, independent study behaviors, self-efficacy, and academic success. This study's results reflect the conceptual characteristics of self-efficacy as a motivational construct, and the self-directed processes involved in self-regulated learning. The implications of this study may be used to aid in the development and implementation of curriculum and instructional methods that encourage the use of deeper processing strategies, promote a shared responsibility for learning, and build a foundation for higher-level competency based decision making skills. Findings from this study support the need for future research to explore additional internal and external factors that may further clarify the interrelationships between cognitive self-regulated approaches to learning and successful academic outcomes.

References

American Association of Colleges of Nursing. (2008). The essentials of baccalaureate education for professional nursing practice. Retrieved from http://www.aacn.nche.edu/Education /pdf/BaccEssentials08.pdf

American Association of Colleges of Nursing. (2012). Nursing shortage fact sheet. Retrieved from http://www.aacn.nche.edu/media-relations/NrsgShortageFS.pdf

Balch, W. (2001). Study tips: How helpful do introductory psychology students find them? *Teaching of Psychology, 28*, 272-274.

Bambini, D., Washburn, J., & Perkins, R. (2009). Outcomes of clinical simulation for novice nursing students: Communication, confidence, clinical judgment. *Nursing Education Perspectives, 30*, 79-82.

Bandalos, D. L., Finney, S. J., & Geske, J. A. (2003). A model of statistics performance based on achievement goal theory. *Journal of Educational Psychology, 95*, 604-616.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. *Psychological Review, 84*, 191-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency, *American Psychologist*, *37*, 122-147.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes, 50*, 248-287.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*, 1-26.

Berry, J. (2009). Technology support in nursing education: Clickers in the classroom. *Nursing Education Perspectives, 30*, 295-298.

Blackman, I., Hall, M., & Darmawan, G. N. (2007). Undergraduate nurse variables that predict academic achievement and clinical competence in nursing. *International Education Journal, 8*, 222-236.

Brandon, A. F., & All, A. C. (2010). Constructivism theory analysis and application to curricula. *Nursing Education Perspectives, 31*, 89-92.

Candela, L., Dalley, K., & Benzel-Lindley, J. (2006). A case for learning-centered curricula. *Journal of Nursing Education, 45*, 59-66.

Chemers, M. M., Hu, L., & Garcia, B. F. (2001). Academic self-efficacy and first-year college student performance and adjustment. *Journal of Educational Psychology, 93*, 55-64.

Choi, N. (2005). Self-efficacy and self-concept as predictors of college students' academic performance. *Psychology in the Schools, 42*, 197-205.

Clayton, K., Blumberg, F., & Auld, D. P. (2010). The relationship between motivation, learning strategies and choice of environment whether traditional or including an online component. *British Journal of Educational Technology, 41*, 349-364.

Cohen, J. W. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Cohen, J. (1992). Statistical power analysis. *Current Directions in Psychological Science, 1*, 98-101.

DeVellis, R. F. (2003). *Scale development: Theory and applications* (2nd ed.). Thousand Oaks, CA: Sage.

Dickinson, D. J., & O'Connell, D. Q. (2001). Effect of quality and quantity of study on student grades. *Journal of Educational Research, 83,* 227-231.

Duncan, T. G., & McKeachie, W. J. (2005). The making of the motivated strategies for learning questionnaire. *Educational Psychologist, 40*, 117-128.

Entwistle, N., & McCune, V. (2004). The conceptual bases of study strategy inventories. *Educational Psychology Review, 16,* 325-345.

Gibson, S. E. (2009). Intergenerational communication in the classroom: Recommendations for successful teacher-student relationships. *Nursing Education Perspectives, 30*, 37-39.

Giddens, J., & Brady, D. (2007). Rescuing nursing education from content saturation: The case for a concept-based curriculum. *Journal of Nursing Education, 46,* 65-69.

Goldenberg, D., Andrusyszyn, M. A., & Iwasiw, C. (2005). The effect of classroom simulation on nursing students' self-efficacy related to health teaching. *Journal of Nursing Education, 44,* 310-314.

Hadwin, A. F., Winne, P. H., Stockley, D. B., Nesbit, J. C., & Woszczyna, C. (2001). Context moderates students' self-reports about how they study. *Journal of Educational Psychology, 93,* 477-487.

Heikkila, A., & Lonka, K. (2006). Studying in higher education: Students' approaches to learning, self-regulation and cognitive strategies. *Studies in Higher Education, 31,* 99-117.

Howe, N., & Strauss, W. (2000). *Millennials rising: The next great generation.* New York, NY: Vintage Books.

Institute of Medicine. (2011). *The future of nursing: Leading change, advancing health.* Washington, DC: The National Academies Press.

Johanson, L. (2012). Teaching the millennial generation: Considerations for nurse educators. *Nurse Educator, 37,* 173-176.

Kantor, S. A. (2010). Pedagogical change in nursing education: One instructor's experience. *Journal of Nursing Education, 49,* 414-417.

Kuiper, R. A. (2005). Self-regulated learning during a clinical preceptorship: The reflections of senior baccalaureate nursing students. *Nursing Education Perspectives, 26,* 351-356.

Kuiper, R. A., Murdock, N., & Grant, N. (2010). Thinking strategies of baccalaureate nursing students prompted by self-regulated learning strategies. *Journal of Nursing Education, 49*, 429-436.

Kuiper, R. A., & Pesut, D. J. (2004). Promoting cognitive and metacognitive reflective reasoning skills in nursing practice: Self-regulated learning theory. *Journal of Advanced Nursing, 45*, 381-391.

Landis, B. D., Altman, J. D., & Cavin, J. D. (2007). Underpinnings of academic success: Effective study skills use as a function of academic locus of control and self-efficacy. *Psi Chi Journal of Undergraduate Research, 12*, 126-130.

Levett-Jones, T. (2005). Self-directed learning: Implications and limitations for undergraduate nursing education. *Nurse Education Today, 25,* 363-368.

Linnenbrink, E. A., & Pintrich, P. R. (2003). The role of self-efficacy beliefs in student engagement and learning in the classroom environment. *Reading & Writing Quarterly, 19*, 119-137.

Mangold, K. (2007). Educating a new generation teaching baby boomer faculty about millennial students. *Nurse Educator, 32,* 21-23.

McCurry, M. K., & Hunter Revell, S. M. (2011). Evaluating the effectiveness of personal response system technology on millennial student learning. *Journal of Nursing Education, 50,* 471-474.

McCurry, M. K., & Martins, D. C. (2010). Teaching undergraduate nursing research: A comparison of traditional and innovative approaches for success with millennial learners. *Journal of Nursing Education, 49,* 276-279.

McGlynn, A. (2007). Millennials in college: How do we motivate them? *The Hispanic Outlook in Higher Education, 17*(1), 34-36.

Mullen, P. A. (2007). Use of self-regulating learning strategies by students in the second and third trimesters of an accelerated second-degree baccalaureate nursing program. *Journal of Nursing Education, 46,* 406-412.

National League for Nursing. (2005). Transforming nursing education. Retrieved from http://www.nln.org/aboutnln/PositionStatements/transforming052005.pdf

National League for Nursing. (2012). *Executive summary: Findings from the annual survey of schools of nursing academic year 2010-2011.* New York, NY: Author.

Notarianni, M. A., Curry-Lourenco, K., Barham, P., & Palmer, K. (2009). Engaging learners across generations: The progressive professional development model. *The Journal of Continuing Education in Nursing, 40,* 261-266.

Ofori, R., & Charlton, J. P. (2002). A path model of factors influencing the academic performance of nursing students. *Journal of Advanced Nursing, 38,* 507-515.

O'Shea, E. (2003). Self-directed learning in nurse education: A review of the literature. *Journal of Advanced Nursing, 43,* 62-70.

Pallant, J. (2010). *SPSS survival manual* (4th ed.). Berkshire, England: McGraw-Hill.

Pardue, K. T., & Morgan, P. (2008). Millennials considered: A new generation, new approaches, and implications for nursing education. *Nursing Education Perspectives, 29*, 74-79.

Patterson, C., Crooks, D., & Lunyk-Child, O. (2002). A new perspective on competencies for self-directed learning. *Journal of Nursing Education, 41*, 25-31.

Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review, 16*, 385-407.

Pintrich, P. R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*, 33-40.

Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ).* Ann Arbor, MI: Author.

Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Robb, M. (2012). Self-efficacy with application to nursing education: A concept analysis. *Nursing Forum, 47*, 166-172.

Severiens, S., Ten Dam, G., & Van Hout Wolters, B. (2001). Stability of processing and regulation strategies: Two longitudinal studies on student learning. *Higher Education, 42*, 437-453.

Sinclair, B., & Ferguson, K. (2009). Integrating simulated teaching/learning strategies in undergraduate nursing education. *International Journal of Nursing Education Scholarship, 6*, 1-11.

Stanley, M. J. C., & Dougherty, J. P. (2010). A paradigm shift in nursing education: A new model. *Nursing Education Perspectives, 31*, 378-380.

Strang, S. L., Bagnardi, M., & Utz, S. W. (2010). Tailoring a diabetes nursing elective course to millennial students. *Journal of Nursing Education, 49*, 684-686.

Valiga, T. M. (2012). Nursing education trends: Future implications and predictions. *Nursing Clinics of North America, 47*, 423-34.

Vanderstoep, S. W., Pintrich, P. R., & Fagerlin, A. (1996). Disciplinary differences in self-regulated learning in college students. *Contemporary Educational Psychology, 21*, 345-362.

Walker, J. T., Martin, T., White, J., Elliott, R., Norwood, A., Mangum, C., & Haynie, L. (2006). Generational (age) differences in nursing students' preferences for teaching methods. *Journal of Nursing Education, 45*, 371-374.

Willoughby, T., Wood, E., & Kraftcheck, E. R. (2003). When can a lack of structure facilitate strategic processing information? *British Journal of Educational Psychology, 73*, 59-69.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist, 25*, 3-17.

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology, 25*, 82-91.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice, 41*, 64-72.

Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal, 45*, 166-183.

Zusho, A., & Pintrich, P. R. (2003). Skill and will: The role of motivation and cognition in the learning of college chemistry. *International Journal of Science Education, 25*, 1081-1094.

APPENDIX A

MSLQ and Demographic Survey

Directions: As you read questions 1 – 22 think about this present course. Please circle the number that best describes your beliefs about succeeding in this course, and the learning strategies that you are presently using in this course. If you choose not to participate, turn the survey over and write on the back of the survey how you approach studying in general. Once you are finished please place this survey in the designated box at the front of the classroom.

1. I believe I will receive an excellent grade in this class.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

2. I'm certain I can understand the most difficult material presented in the readings for this course.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

3. I'm confident I can understand the basic concepts taught in this course.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

4. I'm confident I can understand the most complex material presented by the instructor in this course.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

5. I'm confident I can do an excellent job on the assignments and tests in this course.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

6. I expect to do well in this class.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

7. I'm certain I can master the skills being taught in this class.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

8. Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

9. When I study for this class, I practice saying the material to myself over and over.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

10. When studying for this class, I read my class notes and the course readings over and over again.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

11. I memorize key words to remind me of the important concepts in this class.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

12. I make lists of important terms for this course and memorize the lists.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

13. When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

14. I try to relate ideas in this subject to those in other courses whenever possible.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

15. When reading for this class, I try to relate the material to what I already know.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

16. When I study for this course, I write brief summaries of the main ideas from the readings and the concepts from the lectures.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

17. I try to understand the material in this class by making connections between the readings and the concepts from the lectures.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

18. I try to apply ideas from course readings in other class activities such as lecture and discussion.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

19. When I study the readings for this course, I outline the material to help me organize my thoughts.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

20. When I study for this course, I go through the readings and my class notes and try to find the most important ideas.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

21. I make simple charts, diagrams, or tables to help me organize course material.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

22. When I study for this course, I go over my class notes and make an outline of important concepts.

Not at all true of me						Very true of me
1	2	3	4	5	6	7

Please answer the following questions:

23. What is your gender?

- o Male
- o Female

24. What is your age? _____

25. What is your primary ethnic / racial background?

- o African American
- o Asian/Pacific
- o Hispanic/Latino
- o Caucasian (non-Hispanic)
- o Native American
- o Other (Specify) _____
- o Prefer not to answer

26. What is the number of hours you spend a week studying for this course? This involves any work that is completed outside of the scheduled class time. _____

27. What is your cumulative grade point average (GPA)? _____

APPENDIX B

Cover Letter
(On IUP letterhead)

Factors that Influence Cognitive Engagement and Academic Success of Pre-licensure Baccalaureate Millennial Nursing Students

You are invited to participate in a research study. The following information is provided in order to help you make an informed decision whether or not to participate. If you have any questions please do not hesitate to ask. You are eligible to participate because you are a senior nursing student in IUP's nursing program enrolled in a nursing theory course during the Fall 2013 semester.

Study Description The purpose of this study is to assess factors that influence the academic success of pre-licensure baccalaureate nursing students. This study involves completing a brief questionnaire. You will be asked to rate how items best describe your beliefs to succeed in a nursing theory course, and the approach you are taking to learn the content presented in the course. Your participation will take approximately 10 minutes. Your responses will be anonymous.

Compensation and Benefits Your participation is strictly voluntary and has no bearing on your grades or enrollment at Indiana University of Pennsylvania. Your involvement could help in the identification of methods and strategies for encouraging student learning in the classroom. No compensation will be provided for your participation.

Risks There are no known risks associated with participating in this study.

Confidentiality Any form of information obtained during this study will remain anonymous. None of your responses can be traced back to you. Your course instructor will not know if you participated or what your recorded responses are. The results of the study may be published or presented at a professional conference. All of the collected information will be analyzed and reported as aggregate data. Only the investigator of this study will have access to the data.

For More Information This research is being done by Meigan Robb under the direction of Dr. Teresa Shellenbarger. If you have questions about this study at any time you may contact Meigan Robb via email (uhjybcb@iup.edu). Additionally, once the research is completed you can contact the researcher to obtain outcome information from the study.

If you are willing to participate in this study, consent will be implied by completing and submitting the attached survey. If you choose not to participate, turn the survey over and write on the back of the survey how you approach studying in general. Once you are finished please place this survey in the designated box at the front of the classroom. Thank you for your time and consideration.

This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724-357-7730).

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