

IDENTIFICATION AND COMPARISON OF ACADEMIC SELF REGULATORY  
LEARNING STRATEGY USE OF STUDENTS ENROLLED IN TRADITIONAL  
AND ACCELERATED BACCALAUREATE DEGREE NURSING PROGRAMS

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Submitted to the faculty of the University Graduate School  
in partial fulfillment of the requirements  
for the degree  
Doctor of Philosophy  
in the School of Nursing  
Indiana University

October 2009

Accepted by the Faculty of Indiana University, in partial  
fulfillment of the requirements for the degree of Doctor of Philosophy.

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## DEDICATION

These are only hints and guesses,  
Hints followed by guesses, and the rest  
Is prayer, observance, discipline, thought, and action.

–T. S. Elliot–

## In Gratitude

This work is dedicated to the people who have graciously and continually inspired and supported me throughout my entire life—from my infancy and beyond. Although the number of these souls is extravagant, all encouraged me and continue to inspire me to become better: a better person, friend, nurse, mentor, member of the family, and member of the community at large. My gratitude for all the gifts and opportunities bestowed upon me by The Maker of All has created opportunities for me to extend myself in kindness and openness to those who cross my path. I offer my gratitude for these blessings as a re-gifting to the universe.

There are, in fact, some very special people to whom this dissertation is specifically dedicated. My mother Helen was a shining light in my life. I would never have come this far in my education and my life without the love, encouragement, and support of my husband Bill. I also wish to dedicate this work to my children, Hilary and Michael, who have always inspired me to reach higher.

## ACKNOWLEDGEMENTS

A Master is not one with the most students,  
but the one who creates the most Masters.

–N. Walsch–

I am indebted to the members of my dissertation committee for my development as a scholar, person, and nurse scientist. Their knowledge, expertise, and support were integral towards the reaching of my goals. Dr. Diane Billings kept me on the road to scholarship and taught me what a supportive, confident, and effective guide a committee chair should be. Her “keep moving forward” hand gesture was plainly visible and heartily felt both in person as well as from the 1,100 miles that separated us most of the time. Dr. Dan Pesut, who originally talked me into applying at IUPUI (even though he did not know it), fostered confidence in my efforts during my doctoral program. His “third story thinking” and friendship has forever enriched my life. Dr. Jan Beckstrand taught me the meaning of science and the particulars of statistics while examining the data from this study. Her teaching of one of the very beginning classes in the doctoral program, as well as our long conversations about the meaning extracted from the data collected in this research study, taught me more about becoming a scientist than anything I had ever experienced. My gratitude also is extended to Dr. Raymond Wlodkowski, whose kindness and expertise regarding adult and accelerated learning was indispensable to the quality and inclusiveness of my work.

I would also like to acknowledge the assistance and express my gratitude to the William and Doris Rodie Dissertation Scholarship for providing me with needed financial support for my dissertation research.

## ABSTRACT

Patricia A. Mullen

### IDENTIFICATION AND COMPARISON OF ACADEMIC SELF REGULATORY LEARNING STRATEGY USE OF STUDENTS ENROLLED IN TRADITIONAL AND ACCELERATED BACCALAUREATE DEGREE NURSING PROGRAMS

**Objective:** To explore and compare the use of metacognitive, cognitive, and environmental resource management self regulatory learning (SRL) strategies used by a national sample of students enrolled in traditional and accelerated baccalaureate nursing programs.

**Background:** Learner focused reforms in nursing education require students to assume more responsibility for learning. Nursing student responsibility for learning is reflected in their use of metacognitive, cognitive, and environmental resource SRL strategies. Learning strategy use promotes the development of clinical reasoning and lifelong learning skills requisite to meet the needs of complex patients in a dynamic healthcare environment.

**Method:** Using Bandura's social cognitive theory as a framework, the learning subscales of the Motivated Strategies for Learning Questionnaire were used to survey a national sample of 514 baccalaureate nursing students enrolled in their final semester of a traditional baccalaureate nursing program or a 12-month accelerated baccalaureate program. Delineation of student use of metacognitive, cognitive (rehearsal, organization, and elaboration), and environmental resource management (help seeking, peer

learning, effort regulation, and time and study environment) SRL strategies was examined by program and in light of age, grade point average (GPA), weekly hours spent studying independently, and weekly hours spent in employment.

Results: Differences in SRL strategy use were found between the program groups and between program groups divided by sample age. Older students in both the accelerated and traditional programs used more metacognition and elaboration SRL strategies than their younger traditional counterparts. Older traditional students used significantly more effort regulation SRL strategies than both groups of younger students. Both older groups of students studied significantly more, used significantly more time and study environment SRL strategies, and had significantly higher GPAs than the younger groups of students from both programs.

Conclusions: This study provides a framework for learner focused nursing education by explicitly defining differences in SRL strategy use of students enrolled in traditional and accelerated baccalaureate nursing programs.

Diane M. Billings, Ed.D., RN, FAAN, Chair

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## CHAPTER I

### INTRODUCTION

#### Overview

This exploratory study assessed and compared the self regulatory learning (SRL) strategy use of a national sample of students enrolled in traditional and accelerated baccalaureate nursing programs. Bandura's social cognitive learning theory provided the theoretical foundation for this study. The aim of this study was to determine the types and degree to which students enrolled in traditional and accelerated baccalaureate programs use metacognitive, cognitive, and environmental SRL strategies to achieve academic success. A comparison of strategy use between groups is discussed. The relationship between learner demographic variables and SRL strategy use of students in the traditional and accelerated baccalaureate nursing programs is also explored. The ability of SRL strategy use and demographic variables to predict learner grade point average (GPA) in nursing courses is delineated.

#### Background of Study

Advances in medical and surgical care, increasing client diversity, and the aging of society have changed the predominant mode of healthcare delivery from that of an acute care model to one in which care is delivered to manage multiple chronic conditions (Haskett, 2006). Learner-focused models of baccalaureate nursing education, which are responsive to increasingly diverse student learning needs and which foster students' active engagement in self regulation of their learning, are believed to

better align nursing education to present and future practice needs (Flesner, Scott-Cawiezell, & Rantz, 2005; National League for Nursing, 2005; O'Shea, 2003; Patterson, Crooks, & Lunyk-Child, 2002). The paradigm shift towards learner-focused nursing education stipulates that, although the responsibility for learning is shared through collaborative efforts between students and faculty, learners need to assume more ownership of learning outcomes (Candela, Dalley, & Benzel-Lindley, 2006; Pardue, Taglareni, Valiga, Davison-Price, & Orehowsky, 2005).

Nursing students must become self regulated learners to deliver lifelong safe and effective nursing care through the development and refinement of adaptive, strategic, and skillful learning strategy use necessary to acquire and process information. As active and autonomous guides of their learning, self regulated learners appraise, identify, and interpret their learning situation in order to decide upon and take appropriate action to learn more effectively. SRL refers to a complex, interactive, domain-specific, adaptive process whereby an individual learner is able to attain personalized academic goals through the use of pro-active and self directed internal (metacognitive and cognitive) and external social (environmental resource management) behavioral regulatory learning strategies.

### *Self Regulatory Learning Strategies*

SRL strategies are defined as adaptive thought processes and behaviors in which a learner engages that are intended to positively influence the learner's knowledge acquisition. Personal and contextual motivation and commitment to learning goals provides an initial and ongoing impetus for the use of SRL strategies (Newman,

2002). The goal of any particular learning strategy may be to affect the learner's motivational or affective state or the way in which the learner selects, acquires, organizes, or integrates new knowledge. SRL strategy use provides the context for continuing flexibility and restructuring of academic goals, self efficacy, learner attributional beliefs, and procedural knowledge (Borkowski, Chan, & Muthukrishna, 2000).

### *Metacognitive Self Regulatory Learning Strategies*

Metacognitive SRL strategies refer to internal, intentional, goal-directed strategic internal thought processes (Boekarts & Corno, 2005; Ertmer & Newby, 1996; Pintrich & Degroot, 1990; Ross, Green, Salisbury-Glennon, & Tollefson, 2006). Guided by metacognitive knowledge of self, task, and goals, metacognitive SRL strategies consist of interactive self reflective observations, planning, monitoring, and evaluative thought processes (White, 1999). Metacognitive SRL strategies link and provide feedback to and from personal and environmental factors towards the use of cognitive and environmental resource SRL strategies (Zimmerman & Bandura, 1994). Metacognitive declarative, procedural, and conditional knowledge yielded by the use of metacognitive SRL strategies may further promote learning by regulating the use of future goal oriented and task appropriate cognitive and environmental resource management SRL strategies (Brown, 1987; Pintrich, 2002; Schraw, 1998).

### *Cognitive Self Regulatory Learning Strategies*

Cognitive SRL strategies are employed by the learner to support encoding of new information into both short and long term memory. These strategies also assist the



learner to process new knowledge to make it relevant to previously acquired domain knowledge. Cognitive SRL strategies are classified as surface or deep information processing strategies (Entwistle & McCune, 2004). Surface cognitive SRL strategies involve basic information processing behaviors that are indicative of a reproducing orientation to learning. Although surface information processing approaches are suitable for simple learning tasks, these cognitive SRL strategies could also be used as an initial strategy for more complex tasks (Duncan & McKeachie, 2005).

### *Rehearsal*

Rehearsal refers to repetition and memorization of new information that activates short term storage of material to be learned into working memory for short term recall. One type of rehearsal, rote rehearsal, involves vocal or subvocal cyclic repetition of information, such as naming items from a list (Benjamin & Bjork, 2000). Rote rehearsal is considered a surface information processing SRL strategy that is appropriate for simple learning tasks (Entwistle & McCune, 2004).

### *Organization*

Organization is a cognitive learning strategy that involves constructing connections among new information to be learned. Organizing SRL strategies involve identifying and selecting salient course content for study, as well as arranging new information into coding systems. Organizational SRL strategies include grouping, outlining, diagramming, and concept mapping.

## *Elaboration*

Elaboration is a cognitive learning strategy that involves learner association and integration of new material with previously learned information. Elaboration SRL strategies construct internal connections between new and previously learned knowledge. Elaboration learning strategies promote both efficacy in the encoding of new information into long term memory and efficiency of retrieval (Ertmer & Newby, 1996). Examples of elaboration strategies include paraphrasing, summarizing, forming analogies, mental imagery, and interrogation techniques (Willoughby, Wood, & Kraftcheck, 2003). Elaboration rehearsal techniques, including creating mnemonics, foster the integration of memorized information into long term memory (Benjamin & Bjork, 2000).

Organization and elaboration are considered deep information processing approaches to learning. Deep information processing strategies are differentiated from surface approaches by their adaptability to more complex learning tasks and their reported relationship to mastery rather than performance achievement goal orientations (Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Lyke & Kelaher Young, 2006; McKenzie & Gow, 2004). The use of organizing and elaboration SRL strategies is believed to extract meaning from new information and signal active and deep involvement in the learning endeavor (Boekarts & Corno, 2005; Hattie, Biggs, & Purdie, 1996; Pintrich, 2002).

*Environmental Resource Management  
Self Regulatory Learning Strategies*

Conceptions of environmental resource management SRL strategies are derived primarily from social cognitive and social constructivist learning theories. Environmental resource management SRL strategies involve both personal and social learner actions that are geared towards control of personal and contextual environmental resources. Environmental resource management SRL strategies are adaptive, external, and social learning behaviors that require the learner to develop and use metacognitive, cognitive, and social competencies.

*Help Seeking*

Help seeking refers to an environmental resource management SRL strategy that engaged learners employ to obtain assistance from a person they consider to be more competent than themselves. Previous experiences in seeking assistance act as mediators of present experiences. Help seeking is a social strategy that relies on personal and contextual determinants. Faculty availability and receptivity to students actively seeking assistance provide an important social influence in the context of the learning environment (Karabenick, 2004).

Learner need or desire for seeking assistance is fostered by metacognitive monitoring and evaluative judgments regarding learning goal achievement (Stavrianopoulos, 2007). Help seeking strategy use is influenced by learner goal orientation. Help seeking SRL strategy use derived from instrumental (adaptive) learning goals is designed to decrease the need for future assistance. Help seeking SRL

strategy use, which serves executive (expedient) learning goals, involves enlisting help from others to avoid the work of learning (Karabenick & Knapp, 1988).

### *Peer Learning*

Peer learning refers to an environmental resource management SRL strategy that results in knowledge sharing achieved by formal or informal collaborative interaction and interdependence between participants. Peer learning is fostered by mutual goals, rewards, roles, and resources (Cohen, 1994; Colbeck, Campbell, & Bjorkland, 2000). The use of this SRL strategy is intended to transform individual and collective understanding of concepts related to course materials. Successful use of peer learning has been demonstrated to assist students to problem solve, develop connective elaboration cognitions, and internalize meanings (Case, Stevens, & Cooper, 2007; Rassuli & Manzer, 2005).

### *Effort Regulation*

Effort regulation is an environmental resource management SRL strategy that denotes adaptive learner thoughts and actions that engenders persistence towards attaining perceived control of the learning environment. Effort regulation involves complex metacognitive and external SRL behavioral strategies that are engineered toward task achievement and learning goal attainment. Volitional control of attention to a learning task is dependent upon the value of the task and learner commitment to goal achievement. Learner attributions, internal locus of control, self efficacy, and available social support further affect conation (Valle et al., 2003; Vendewalle, Brown, Cron, & Slocum, 1999). The relation between perceived control of the learning

environment, effort exerted, and performance is associated with the level of learner motivation, domain knowledge, stress, and ability to cope (Perry, Hladkyj, Pekrun, & Pelletier, 2001; Schmitz & Skinner, 1993).

#### *Time and Study Environment*

Another environmental resource SRL strategy that affords the self regulated learner perceived control of the learning environment involves behaviors geared toward management of study time and environment. The management of study time and environment can maximize or limit intellectual productivity related to academic tasks that lead to academic success. Volitional control of study time is a complex process believed to be linked to time available for study and situational use of metacognitive SRL strategies such as planning, monitoring, and evaluative epistemological judgments (Janssen, 1996). The use of metacognitive SRL strategies assists in all phases of study management: study preparation (task analysis), ongoing study (initiation of study strategy and performance monitoring), and evaluative memory/retrieval/performance testing (Dunloskey & Hertzog, 1998).

#### Baccalaureate Nursing Education Programs

Baccalaureate preparation is believed to best prepare nursing graduates to meet the emergent healthcare needs of an increasingly complex future of healthcare (American Association of Colleges of Nursing, 2007b; Porter-O'Grady, 2001; Tanner, 2004). Two major pathways to achieving a baccalaureate degree in nursing exist at the present time. Initially developed at the turn of the last century in response to changing societal need, a traditional or basic generic baccalaureate program is a four-year college or

university program that incorporates a variety of liberal arts courses in the first two years with the bulk of professional education in nursing accomplished during the final two years of study (Amos, n.d.; Krampitz, 1983). These programs were designed primarily for high school graduates with no prior nursing experience.

A more recent innovation in baccalaureate nursing education is the development of accelerated baccalaureate nursing programs, which provide an opportunity for non-nursing college graduates from substantially diverse backgrounds to obtain a second baccalaureate degree with a rapid transition into nursing (Seldomridge & DiBartolo, 2005). The most common curriculum approach for accelerated baccalaureate nursing programs involves a course of study that is similar if not identical to the course and clinical requirements of traditional baccalaureate education. This curriculum approach requires students to take a heavy course load each semester to finish two upper division years of study at an accelerated pace, generally between 11 and 18 months (Tanner, 2006; Wink, 2005).

#### Statement of the Problem

It is incumbent upon nursing educators to prepare graduates who can make safe and effective clinical decisions in an age of technological innovation and increasing healthcare complexity. Recommendations for strategic reform of nursing education that is responsive to demands of a dynamic healthcare environment, relentless knowledge inflation, and identified need for an interdisciplinary focus in healthcare delivery have been made by nursing education leadership (American Association of Colleges of Nursing, 2008; Diekelmann, 2005; Halstead, 2005; National League for Nursing,

2003; Tanner 2004). Older, content-driven models of nursing education are recommended to be replaced with evidence-based, learner-focused models (National Council of State Boards of Nursing, 2004; National League for Nursing, 2005). Newer, evidenced-based models of baccalaureate nursing education must be created to accommodate the needs of increasingly diverse nursing student populations enrolled in distinct baccalaureate nursing programs.

A primary step in the creation of learner-focused baccalaureate nursing curricula involves assessment of the learners enrolled in both traditional and accelerated learning formats. In order to foster optimal learning, there is a need to understand adaptive SRL strategy use, which makes high quality learning outcomes possible. Most traditions in nursing education related to student self regulation of learning have little support in research evidence.

#### Purpose of the Study

The purpose of this descriptive exploratory research was to explore and compare the types and use of SRL strategies reported by a national sample of students enrolled in traditional and accelerated baccalaureate nursing programs. Differences in the types and extent of student use of metacognitive, cognitive (rehearsal, organization, and elaboration), and environmental resource management (help seeking, effort regulation, peer learning, and time and study environment) were explored between the two groups of students. The relationship of SRL strategy use to demographic factors of age, hours of employment per week, and length of time spent studying independently per week was examined. The ability of SRL strategy use and demographic factors to

predict present self reported GPA, a traditional measure of academic success, was examined for students enrolled in traditional and accelerated baccalaureate nursing programs.

### Research Questions and Hypotheses

The following research questions and hypotheses were examined:

RQ1: Are there differences in the reported use of metacognitive and cognitive (rehearsal, organization, and elaboration) self regulatory learning strategies between students enrolled in traditional baccalaureate nursing programs and in accelerated baccalaureate nursing programs?

H1: Students enrolled in accelerated baccalaureate nursing programs will use more metacognitive and cognitive (rehearsal, organization, and elaboration) self regulatory learning strategies than students enrolled in traditional baccalaureate nursing programs.

RQ2: Are there differences in the reported use of environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies between students enrolled in traditional baccalaureate nursing programs and in accelerated baccalaureate nursing programs?

H2: Students enrolled in accelerated baccalaureate nursing programs will use more environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies than students enrolled in traditional baccalaureate nursing programs.

RQ3: What is the relationship of use of metacognitive and cognitive (rehearsal, organization, and elaboration) self regulatory learning strategies by students enrolled in traditional and accelerated baccalaureate nursing programs to learner age, number of hours spent studying independently, and number of hours spent working per week?

H3: Students enrolled in accelerated baccalaureate nursing programs who are older, spend more time studying independently, and spend less time working per week will use more metacognitive and cognitive (rehearsal, organization, and elaboration) self regulatory learning strategies than students enrolled in traditional baccalaureate nursing programs who are younger, spend less time studying independently, and spend more time working per week.



RQ4: What is the relationship of the use of environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies by students enrolled in traditional and accelerated baccalaureate nursing programs to age, number of hours spent studying independently, and number of hours spent working per week?

H4: Students enrolled in accelerated baccalaureate programs who are older, spend more time studying independently, and spend less time working will use more environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies than students enrolled in traditional baccalaureate nursing programs who are younger, spend less time studying independently, and spend more time working per week.

RQ5: Is the use of metacognitive, cognitive (rehearsal, organization, and elaboration), and environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies and demographic factors of type of program, age, hours spent studying per week, and hours spent working per week predictive of student self reported grade point average in nursing courses?

H5: Use of metacognitive, cognitive (rehearsal, organization, and elaboration), and environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies and time spent studying independently will be positively predictive of student self reported grade point average.

### Significance of the Study

This study provides substantive information regarding similarities or differences in the SRL strategies students use while enrolled in different types of baccalaureate nursing education programs. Assessment and evaluation of SRL strategy use provides insight into the ways students enrolled in both types of baccalaureate programs perceive, interact, and respond to the current environment in which their learning occurs. Appraisal and evaluation of the effects of demographic factors on the SRL strategy use of students enrolled in traditional and accelerated baccalaureate nursing programs may assist nurse educators to increase their awareness of learner

characteristics, which may alter the study strategies baccalaureate nursing students use in both types of programs. This increased awareness may allow nurse educators to become more responsive to both the unique and common needs of students enrolled in both types of baccalaureate nursing education programs.

Results of this study may facilitate further flexibility in baccalaureate nursing program management and promote the goal of increasing diversity in the nursing workforce (American Association of Colleges of Nursing, 2001; Institute of Medicine, 2004). Faculty consideration and evaluation of SRL strategies used by students who are successful in their baccalaureate programs may not only increase fluid movement of students between courses in different baccalaureate options, but may also have a beneficial effect on the high attrition rates attributed to racial minorities and economically disadvantaged students enrolled in nursing programs (Gardner, 2005; Mingo, 2008; Seago & Spetz, 2005). Flexibility in baccalaureate nursing program design may also have a beneficial effect on utilization of nursing faculty in a period of nursing faculty shortage.

Dissemination of learner-focused research, which delineates the use of SRL strategies by nursing students enrolled in both traditional and accelerated options, may help to decrease the perceived need of nurse educators to focus on a shifting and ever expanding amount of both the nature and amount of content information. Attention to the self regulatory thought processes and behaviors used by students to learn and acquire knowledge can assist in shifting the educator's focus from content mastery to

assisting students in their learning strategy use geared towards continuing professional adaptation within an ever changing healthcare landscape.

Results of this study are elemental to the development of an evidence-based innovative learner-focused framework for nursing education. Information gained from this study may assist nursing program planners to create a best practice model of curriculum design for both types of programs aimed at learner development and use of a repertoire of SRL strategies that are both responsive to present and emergent clinical nursing practice. This research may thereby contribute to the science of nursing education by providing learner information to support the creation of learning environments that engender problem solving skills, encourage the development of clinical reasoning skills, and endorse adaptive strategies for life-long learning.

## CHAPTER II

### THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

#### Overview

A review of literature regarding nursing student characteristics and differences between students enrolled in traditional and accelerated baccalaureate nursing programs is provided within this chapter. A review of relevant literature related to SRL strategies of metacognitive, cognitive (rehearsal, organization, and elaboration), and environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) used by students enrolled in higher education is rendered. Social cognitive theory, which provides the theoretical framework for the present study, is described. A social cognitive model of self regulated learning in baccalaureate nursing education programs that is derived from that theoretical base is defined.

#### Nursing Students Enrolled in Traditional and Accelerated Baccalaureate Nursing Programs

Research has provided a limited profile of students enrolled in both types of undergraduate baccalaureate nursing programs. Anecdotal information highlights similarities and differences between traditional and accelerated cohorts (Cangelosi & Whitt, 2005). Though both groups demonstrate a positive attitude toward nursing (Toth, Dobratz, & Boni, 1998), demographic information collected from students enrolled in accelerated programs indicate that they bring a level of maturity and life

experiences consistent with adult learners that is different from the majority of students enrolled in traditional baccalaureate education programs (Meyer, Hoover, & Maposa, 2006; Seldomridge & DiBartolo, 2005). Descriptive research comparing academic achievement and national licensing examination (NCLEX) pass rates of students enrolled in traditional and accelerated baccalaureate nursing programs indicate that students involved in accelerated programs of study do as well or slightly better than students enrolled in traditional programs (Bentley, 2006; Korvick, Wisener, Loftis, & Williamson, 2008; McDonald, 1995; Shiber, 2003; Vinal & Whitman, 1994).

A recent empirical investigation involving students enrolled in traditional and accelerated nursing programs at one university confirms anecdotal information contained in the literature regarding differences between these two groups of students. Walker et al. (2007) demonstrated that students enrolled in an accelerated baccalaureate nursing program self reported statistically greater self directedness and motivation towards learning than their traditional counterparts, independent of age. Non-nursing college graduates in this nursing program also demonstrated significantly higher expectations for classroom structure and faculty guidance. Study results further revealed that grades received from courses were significantly more important to students enrolled in the accelerated baccalaureate nursing program.

In addition, a 2005 repetition of a 1988 study (Wu & Connelly, 1992) profiling demographic characteristics of all students enrolled in accelerated programs revealed that similar demographic characteristics of age, previous degree, health care

experience, gender, and ethnic diversity of students enrolled in 25 accelerated programs continued to be similar to what they were in 1988 (Siler, Debasio, Roberts, & Spencer, 2006). There are a higher percentage of male students enrolled in accelerated programs than in traditional baccalaureate nursing programs. Students in accelerated programs tend to be older than their traditional counterparts (Brown, Alverson, & Pepa, 2001; Suplee & Glasgow, 2008; Toth et al., 1998). Results of a recent retrospective comparison of accelerated baccalaureate nursing students admitted from 1997 to 2002 and students admitted from 2003 to 2006 at one university demonstrated that students enrolled more recently were older ( $> 23$ ) and more diverse regarding previous degree and gender than previous cohorts (Seldomridge & DiBartolo, 2007).

In a pilot study undertaken to examine the types and extent of cognitive and environmental resource management SRL strategy use of two groups of students enrolled in an accelerated baccalaureate nursing program at one university, student use of both cognitive and environmental resource management SRL strategies was significantly associated with time spent studying independently. Students who were close to completion of the 12-month accelerated baccalaureate nursing program used significantly more resource management strategies than students who had completed only one semester of a 3-semester accelerated program (Mullen, 2007).

### Self Regulatory Learning in Higher Education

A review of the research on learner SRL strategy use in higher education includes international descriptive as well as interventional research that has been undertaken to demonstrate an association between SRL strategy use and traditional

measures of academic success. Both types of research most commonly utilized convenience sample cohorts of first-year university students in introductory courses. The reviewed research generally offers insight into the complexity of this construct and the influence of cognitive, personal, and environmental factors in SRL strategy selection and use. SRL strategy use has consistently demonstrated a positive association to context-specific academic achievement independent of intelligence in multiple quantitative quasi-experimental studies across educational disciplines and single site or multi-site studies (Busato, Prins, Elshout, & Hamaker, 1998; Minneart & Janssen, 1999; Vanderstoep, Pintrich, & Fagerlin, 1996).

Several studies have demonstrated the importance of instructional support and design to learner motivation and SRL strategy use. Specific strategies such as autonomy support provided by weekly group meetings led by graduate students to undergraduate students enrolled in a chemistry course (Black & Deci, 2000) and consistent verbal praise provided to students by the instructor in a graduate level statistics course (Hancock, 2002) have been shown to assist students to adapt to the learning environment by encouraging the development and use of SRL strategies such as planning, organization, and help seeking.

Learning supports such as an online media center, Web site links, and posting of model assignments also facilitated use of SRL strategies in the classroom. A large effect size was reported in laboratory research where undergraduate psychology students were trained in the use of SRL strategies including planning, monitoring, goal directed memorization, and elaborative rehearsal in a hypermedia environment.

Students in the experimental group outperformed students without similar training in mental model conceptions, diagramming, and essay testing (Azevedo & Cromley, 2004).

In contrast, courses designed to specifically teach SRL strategies have been shown to have a moderate effect both on successfully assisting students in the development of SRL strategies and on increasing intrinsic motivation for learning (Hofer & Yu, 2003; Jakubowski & Dembo, 2002; Schapiro & Livingston, 2000). It was not made clear if the principal investigator was also the teacher of the students who comprised the samples. Results of these studies may have been affected by student self selection into these courses. Surveys were completed in these studies immediately after the course was completed. No information is available related to the enduring effects of strategy training in regard to student application of SRL strategies in their future university coursework.

*Longitudinal Studies on the Use of Self Regulatory Learning  
Strategies in Higher Education*

Three longitudinal studies from the Netherlands designed to ascertain the effect of higher education on the use of SRL strategies were reviewed. Two of the studies used the Inventory of Learning Styles (Vermunt, 1994) to examine learning style and change in SRL use over the course of a year. Busato et al. (1998) reported that as the use of SRL strategies increased, there was an increase in meaning-directed and application-directed learning styles in two cohorts of psychology students over two years. Severiens, Ten Dam, and Van Hout Wolters (2001) reported that first-year tertiary technical students in the Netherlands, untrained for reflective learning, used



more deep processing strategies at the end of a year of study than at the beginning of the year at the university. Bruinsma (2004) reported that students who used less deep information processing strategies obtained less college credits over a two-year period.

#### *Age and the Use of Self Regulatory Learning Strategies*

In reviewed research studies measuring the relationship of age to SRL strategy use directly after secondary education and mature age students entering university studies in Australia, Archer, Cantwell, and Bourke (1999) found that mature age students (average age 33.8 years), studying in a variety of disciplines, showed more flexibility in adapting to the learning environment by using more metacognitive SRL strategies and had higher GPAs than their younger counterparts. Similar findings were reported in a large Australian study of traditional age and mature age students regarding their use of motivational and SRL strategies (McKenzie & Gow, 2004). Mature age students used more cognitive and motivational strategies than students who attended the university directly after secondary education and demonstrated more conscientiousness related to their studies than traditional students over a two-semester period of time.

#### *Gender and Self Regulatory Learning Strategies*

Consistent differences in SRL strategy use based on gender have been reported in the literature. In research undertaken to demonstrate differences in SRL use based on gender, female undergraduate students enrolled in basic education courses self reported significantly more use of cognitive SRL strategies (Bidjerano, 2005). Female undergraduate students demonstrated use of more metacognitive and environmental

resource SRL strategies and had higher GPAs in two studies of undergraduate students enrolled in different educational disciplines in Australia (Akgun & Ciarrochi, 2003) and the United States (Jakubowski & Dembo, 2002). Although female students were found to have more interest in their studies and have significantly more academic success than male students studying in a university in the Netherlands (Bruinsma, 2004), female students studying in different academic disciplines demonstrated more incompetence fear, test anxiety, and negative expectancy of grades than male students. Negative emotional responses were believed to provide an impetus for increasing the use of SRL strategies among female students in the study.

*Race, Ethnicity, and Income and the Use of Self Regulatory Learning Strategies in Higher Education*

Matriculation and retention of minority and ethnically diverse students in baccalaureate nursing programs is important to decrease healthcare disparity and meet the needs of an increasingly culturally diverse general population (American Association of Colleges of Nursing, 2001; Institute of Medicine, 2004). According to the last nursing workforce survey, nurses from minority backgrounds make up 10.7% of the of the registered nurse workforce (Health Resources and Services Administration, 2004). Even though leadership in healthcare delivery has been focusing on this issue for many years, total minority enrollment in baccalaureate nursing education programs has increased from a low of 20% in 2003 to only 26% in 2008 (American Association of Colleges of Nursing, 2009). Academic, financial, and aspirational barriers have been identified as factors that not only contribute to the low percentage of minority students

enrolled in nursing education programs, but also contribute to higher attrition rates for racially/ethnically diverse students (Gardner, 2005; Seago & Spitz, 2005).

Academic barriers include a lack of secondary school preparation for college (Cook & King, 2004). Academic barriers to success in higher education are compounded by disadvantaged students' general lack of exposure to educational or learning opportunities outside of the classroom (Mango, 2008). Students who are not encouraged to attend higher education may not have developed the SRL strategies that would lead to academic success in baccalaureate nursing programs.

Financial barriers for racial/ethnic minorities include the rising cost of higher education combined with a decrease in the adequacy and availability of grant and loan funding. Even though African Americans take out more loans for higher education offerings than Asian American and Hispanic American students, a majority of all groups have been found to work full or part time to support themselves during their enrollment in college classes due to a lack of available or adequate financial resources (Cunningham & Santiago, 2008). These factors, combined with a variety of culturally mandated family and social responsibilities, contribute to higher attrition rates among these groups of students due to the amount of time it takes to complete a degree (McSwain & Davis, 2007). In one study, an unfavorable effect on academic performance was noted when ethnically diverse nursing students worked 16 hours in a healthcare environment while attending classes (Salamonson & Andrew, 2006). Financial barriers may severely limit the amount of study time and the use of effective strategies for academic success in baccalaureate nursing programs.

Aspirational barriers are related to personal attributions of what the individual student believes they can accomplish. Minority and ethnically diverse students many times lack the environmental resources such as role models and mentoring from significant others in their cultural group who have achieved a college degree, or are in a position of academic leadership (Mingo, 2008). Personal attributions and feelings of isolation when enrolled in a primarily “other” environment may limit positive self efficacy beliefs that have an effect on self monitoring and self judgments related to performance in higher education programs (Gardner, 2005).

*Metacognitive Self Regulatory Learning Strategy  
Use in Higher Education*

There is currently agreement among educational researchers regarding the importance of the relationship of metacognitive to learning. Multiple research efforts have been undertaken to explore and evaluate the relationship of metacognitive monitoring, planning, and reflective activities in the context of learning (Schraw & Mushman, 1995). Research has established an association of metacognitive strategy use and learning strategy use in laboratory experiments in both traditional and non-traditional learning environments.

In accordance with social cognitive learning theory, experimental evidence of social influence on metacognitive comprehension monitoring was reported as a result of a randomized learning laboratory study involving 88 undergraduate psychology students. Karabenick (1996) reported that students assigned to a randomized experimental social confusion condition were found to have significantly more questions related to comprehension of a videotaped presentation than the solitary learner control

group when they believed a co-learner was confused while viewing the same presentation. The number of questions asked by a researcher-created co-learner determined the impact on real time and retrospective monitoring judgments of students in the experimental condition.

Reporting the results of a quasi-experimental laboratory research study involving a convenience sample of students enrolled in an introductory psychology class, Everson, Tobias, and Laitusis (1997) found that metacognitive knowledge monitoring strategies are generalizable across math and verbal domains. Knowledge monitoring measures correlated positively with students' confidence estimates (judgments) related to answering math problems and recognition of word meanings from a vocabulary list. In this study, metacognitive monitoring scores were positively correlated with student GPAs.

A significant positive correlation was demonstrated between scores on the metacognitive monitoring and metacognitive regulation scales of the Metacognitive Awareness Inventory in two separate research studies involving convenience samples of undergraduate college students (Sperling, Howard, Staley, & Dubois, 2004). Both studies also reported a significant positive relationship between metacognitive regulation scores and learning strategy subscale scores. In the same studies, high scores on the Metacognitive Awareness Inventory were reported to be negatively correlated with the amount of student reported dropped classes.

Recommendations and research regarding the use of metacognitive practices to promote learning of students enrolled in undergraduate nursing programs are present

in the nursing education literature (Beitz, 1996, 1998; Chartier, 2001; Worrell, 1990). In one study, Fonteyn and Cahill (1998) reported that students increased their repertoire of metacognitive thinking strategies through the use of reflective clinical logs. A similar finding was reported by Kuiper (2005) investigating the use of self regulated learning prompts and audiotaped clinical reflections of senior nursing students. Descriptive research involving pre clinical medical students in Brazil demonstrated that reflective behaviors were significantly associated with a meaning (deep processing) orientation and GPA (Sobral, 2001).

*Cognitive Self Regulatory Learning Strategy  
Use in Higher Education*

*Rehearsal*

The use of rehearsal was found to be a significant predictor of an introductory chemistry course grade for a large convenience sample ( $n = 458$ ) of first- and second-year students enrolled in introductory chemistry classes. High achieving students used significantly more rehearsal strategies than their lower achieving counterparts when surveyed after week 10 and at the end (week 15) of a semester-long course (Zusho & Pintrich, 2003). The prominent use of rehearsal strategies in an introductory course is appropriate since prior knowledge is believed to be crucial for the adoption and use of deep processing strategies. An increase in the use of deep processing strategies was reported during the same period. As students became more proficient in learning course domain knowledge and concepts, they were able to use more deep processing strategies.

Severeins et al. (2001) reported similar findings in a longitudinal study involving a convenience sample of adult students enrolled in five separate tertiary colleges in the Netherlands. Stepwise processing (rehearsal activities such as selecting facts, concepts, details, definitions, and repeating or rehearsing subject matter) measured by the Inventory of Learning Styles was used significantly more often by constructional architecture and mechanical engineering students at the beginning of a school year than at the end of that year. Student use of concrete processing strategies (elaboration activities such as personalizing course content by relating it to one's own experiences) increased within that same period of time.

### *Organization*

Research involving the study habits of undergraduate students enrolled in multiple sections of a learning principles and classroom management undergraduate course demonstrated the effectiveness of organizing study behaviors. Students were asked to record their time spent studying (minutes per week) and to record the time spent in studying activities as reading, reviewing, or organizing. Even though the study time varied widely among the students, Dickinson and O'Connell (2001) reported that total time spent studying and time spent studying in organizing study materials was a significant predictor of course grades. Since the results were based solely on total scores achieved on course examinations from one class, these results may have also been affected by the nature of test questions on course examinations.

The metacognitive and cognitive learning strategies subscales of the Motivated Strategies for Learning Questionnaire (MSLQ) was used to survey students in

multidisciplinary research involving students enrolled at three different colleges. The use of organization strategies was significantly associated with achievement measured by course final grade in introductory natural science, social science, and humanities courses (Vanderstoep et al., 1996). The high achiever groups in the natural science and social science classes used significantly more metacognitive and organization strategies at the beginning and at the end of the semester-long courses than the medium and low achiever groups. In humanities classes, the use of organization strategies was significantly associated with achievement at the end of the semester. These results were partially explained by the differences in the methods of evaluation used in the science and humanities courses.

A significant difference in the use of organizational strategies was demonstrated between two groups of nursing students surveyed after their first and second semester of a 12-month accelerated baccalaureate nursing program at one university (Mullen, 2007). More deep processing organizational strategies were practiced by the students who were more advanced in their nursing program. This finding is consistent with the literature on the use of deep processing strategies within a course of study.

### *Elaboration*

Students enrolled in an introductory psychology course rated the helpfulness of a study tip sheet distributed by course faculty to promote self assessment (self quizzes, course performance charts, and questions and answers) and comprehension (lecture notes, study groups, and elaborative encoding strategies). Even though the tips regarding lecture notes and development of a course performance chart were used



more often, the use of elaboration encoding strategies was the only study tip significantly correlated to course performance (Balch, 2001).

Several studies using large convenience samples of students at singular universities reported a significant association of the use of elaboration strategies and academic success. The use of elaboration strategies was reported to have a significant association with course achievement and year-end GPA in a study involving a cohort of students enrolled in an introductory psychology course (Perry et al., 2001). Similar findings related to the use of elaboration strategies and academic success measured by course grade were reported in a study involving a large cohort of students enrolled in multiple sections of an introductory course in statistics (Bandalos, Finney, & Geske, 2003). In a large cohort of students enrolled in a variety of disciplines in Finland, student use of a deep learning approach, measured by the Task Booklet of Learning and the Strategy and Attribution Questionnaire, was reported to be significantly associated with university academic success measured by an overall GPA in university studies (Heikkila & Lonka, 2006).

Student self organization of learning materials in a way that was consistent with their knowledge base was found to assist students in memory and retrieval tasks in two separate randomized laboratory experiments. Willoughby et al. (2003) reported that student self organization of non-structured facts provided about animals in an experimental condition enhanced the effects of elaboration interrogation techniques used as a study strategy to stimulate learning. Elaboration interrogation is a verbal questioning strategy that is dependent on existing content knowledge. It requires

students to answer *why* questions about presented materials. Students reported that elaboration interrogation techniques promoted the use of other elaboration strategies as memory devices, such as making mnemonics and imagery.

*Environmental Self Regulatory Learning Strategy  
Use in Higher Education*

*Help Seeking*

Research has involved exploration into personal and contextual determinants of help seeking in higher education. In a field study involving students enrolled in an introductory psychology courses, Ames and Lau (1982) reported that females demonstrated more help irrelevant attributions (performance due to external factors) than males and also sought help from faculty less than male students.

Karabenick and Knapp (1988) explored the relationship of help seeking to need for help assessed by student self ratings of need and grade anticipated in an introductory psychology class. Even though a strong correlation was found between expected grade and need, a regression analysis of actual help seeking behaviors based on anticipated grade showed a curvilinear relationship. Although most of the students reported a need for assistance with courses or study skills, actual help seeking behaviors were greatest for students who anticipated a grade within the B- to C+ range. Cognitive and emotional obstacles, such as threat to self esteem, were postulated to inhibit help seeking behaviors of highly needy students.

Two different help seeking approach patterns were further classified and researched in two separate follow-up studies using a large multi-site multi-disciplinary convenience sample (Karabenick & Knapp, 1991) and a large sample of students

enrolled in introductory and organic chemistry classes (Karabenick, 2004). Expedient help seeking was defined as a help seeking approach used by students to avoid work by involving others. Instrumental help seeking was defined as an adaptive help seeking approach students engage in designed to decrease the need for further help seeking activities. Threat to self esteem was reportedly positively correlated with expedient help seeking activities in both studies.

Students who were enrolled in multiple sections of an introductory psychology class were surveyed during the first week of class to determine their intentions related to a conditional situation of poor performance provided by the researchers. Survey responses indicated that students primarily intended to engage in SRL strategy use to improve performance. Secondary sources for improving performance included help seeking activities from informal sources (peers) and formal sources (faculty) prior to altering their grade goals for the course (Karabenick & Knapp, 1991).

Research using a pretest/posttest design with a large convenience sample of multi-level college students studying in different disciplines in three universities explored the relationship between the use of specific SRL strategies and help seeking activities. Self report survey results from this large convenience sample revealed that the use of cognitive and resource management SRL strategies mediated the need for academic assistance. Students who reported using cognitive and resource management SRL strategies also reported that they were more likely to seek help when it was necessary (Karabenick & Knapp, 1991). Research relating the goals (mastery vs. performance) and approach (mastery vs. avoidance) of students to help seeking

activities revealed a correlation between a mastery help seeking approach and a mastery goal orientation. Course performance was also correlated positively with a mastery help seeking approach. Further, mastery goal-oriented students were more likely to seek help from faculty than from peers (Karabenick, 2004).

### *Peer Learning*

Allen (1993) maintains that in traditional undergraduate education, a student's peer group is the single most important source of influence on growth and development. Through qualitative inquiry, peer learning relationships have been found to support the development of communication and collaboration skills among students. Information obtained from field notes and student completion of a questionnaire demonstrated that collaborative learning peer environments supported and encouraged a variety of learning styles, while creating a positive force for academic achievement through commitment to mutual goals in multiple sections of introductory chemistry classes (Kreke, Fields, & Towns, 1998).

A study undertaken at a Midwestern public university compared small group and large group instruction in multiple sections of undergraduate educational psychology classes. Students reported greater perceptions of task importance; ability to think on task; and optimal levels of engagement, challenge, and skill when exposed to small group cooperative learning environments. The instructional context accounted for 47% of the variance in course grade for that convenience sample (Peterson & Miller, 2004).

Research undertaken in multiple academic disciplines on peer learning has investigated the relationship and effects of formal group interventions on student

learning and achievement. A meta-analysis of 39 studies involving students enrolled in science majors revealed a main effect (Cohen's  $d = 0.51$ ) of greater academic achievement among students who completed small group assignments in comparison to students not exposed to formal peer interaction in their courses. More frequent discussions among students led to greater higher order thinking, but not necessarily to greater content knowledge. Students also expressed more favorable attitudes towards learning and small group class collaboration with increased exposure to group work. Female students expressed more favorable attitudes towards group work than male students (Springer, Stanne, & Donovan, 1999).

In focus group interviews, 65 senior engineering students from multiple engineering programs reported lessons learned from peer interaction in class translated to other life domains. Focus group members reported improved communication skills and better interpersonal relationships in their workplace as a result of course group work. Previous group assignments assisted them in assuming leadership roles in present group work, enhancing both problem defining and problem solving skills, and identifying compatible group members (Colbeck et al., 2000).

### *Effort Regulation*

Structural equation modeling has been used to establish the relationships between effort and achievement. Bandalos et al. (2003) reported that although a hypothesized direct relationship was not found between effort and achievement, significant direct effect was found from deep processing, learning orientation, and test anxiety to effort. Persistence of effort in academic tasks was shown to have a direct

and significant relationship to deep learning strategies, internal attributions, and learning goals in the exploration of a causal model by Valle et al. (2003). Metacognitive analysis of task characteristics, internal attributions, learning goals, and activation of deep learning strategies had a direct and significantly positive effect on persistence in academic tasks. Whereas one study employed a convenience sample of students enrolled in several sections of an introductory statistics class, the latter study used a sample of mixed discipline multi-level college students.

Based on achievement goal theory, a large cohort of first-year students enrolled in an introductory psychology class and one group of baccalaureate nursing students enrolled in a statistics class were surveyed to explore the hypothesized mediating role of volitional control on goal achievement. Volitional control is manifest as directive thoughts and behaviors that maintain the intention towards goal directed effort in spite of internal and external distractions. Garcia, McCann, Turner, and Roska (1998) reported that volitional processes had a positive indirect effect on time management, concentration, information processing, test taking strategies, and use of study aids that were stable across both instructional contexts. Volitional control had a significantly positive direct effect on cognitive SRL strategy use, which is believed to assist in learning goal attainment.

Students attending a college success course who had previously completed four-year baccalaureate degrees ( $n = 7$ ) or had returned to college part time or full time to finish a degree program after of period of withdrawal from studies ( $n = 56$ ) were enlisted in qualitative research aimed at examining the reasons for adult student

persistence of effort towards goal attainment in college studies. Qualitative analysis demonstrated three central themes. Adult participants returned to college to add meaning to their lives after a reevaluation of life direction and goals preceded an increased sense of self awareness. Opportunities for career advancement, financial security, and independence were also found to be reasons for persistence in college studies. Finally, students described family factors, such as being an example for their children, as reasons for their return to college programs. Students viewed their prior life experiences as valuable for the development of coping strategies and as motivational forces directed towards goal attainment (Hensley & Kinser, 2001).

#### *Time and Study Environment*

The relationship between time management strategies and academic success was established in a study involving 90 students enrolled in an introductory psychology class. Through regression analysis, a positive time attitude (intrinsic locus of control related to time management, prioritizing and maintaining time for study, and considering studying more important than grooming) and use of short range study strategies (setting short term study goals, planning, and organizing study/course related activities for the day and up to a week in advance) were found to make a significant contribution (21% of predictable variance) to cumulative GPA at the end of four years of college (Britton & Tesser, 1991). Reliability and validity data of the time management instrument used in this study were not available.

Research has been undertaken to evaluate the effects of study strategy training on students. A meta-analysis of over 400 studies related to teaching strategy training

interventions from 1982 to 1992 revealed that study skills training had a relatively minor effect on performance, but a strong effect on students' attitudes and efficacy towards their studying abilities (Hattie et al., 1996). Two recent studies also investigated the effect of study strategy training on course examination performance. Using a quasi experimental design, Fleming (2002) reported that students enrolled in an introductory psychology class who received five minutes of instruction related to goal setting and study strategies at the end of six class periods performed better in all course exams than students who were not exposed to the intervention. Generalizability of these results was affected by the use of the first-year undergraduate students enrolled in introductory psychology classes.

A meta-analysis of laboratory experiments involving adult student allocation of study time consistently revealed that adults spend more time studying difficult items (Son & Metcalfe, 2000). More recent laboratory research has delineated that adults spend more time studying difficult items only when they have declarative knowledge related to the subject under study. When study time was limited in learning English-Spanish word pairs, participants who scored highest on a posttest measure studied items judged to be of moderate difficulty more than difficult or easier items. Results of this study demonstrated that the nature of the material to be studied has an effect on management of time spent studying as well as performance in academic tasks (Metcalfe & Kornell, 2003).

Management of the study environment was addressed in recent research, which established the relationship between how a student studies and course performance.



Using a convenience sample of primarily first-year undergraduate students enrolled in an introductory psychology course, Gurung (2005) found a significant negative correlation between students who engaged in behaviors such as listening to music, watching television, or using the Internet while studying and course exam performance. Students who missed class also performed significantly worse on course examinations.

Time management of studying was found to have a significant positive relationship to GPA and self reported study habits in research involving a large convenience sample ( $n = 366$ ) of multi-level undergraduate students enrolled in multiple courses at one university. Hours spent working was found to have a significant negative association to GPA. In addition, regression analysis of the data revealed that study habits and hours working per week were significant predictors of GPA. Through discriminant analysis of students in the upper third and lower third of the GPA range with respect to number of hours spent working per week, it was discovered that students who spent more time working were less likely to review material frequently, concentrate less on studying, suffer from sleep deprivation, and not attend classes in which attendance was optional (Lammers, Onwuegbuzie, & Slate, 2001).

#### *Supporting Theoretical Rationale, Social Cognitive Theory*

Social cognitive theory (Bandura, 1986, 1997) provides the theoretical framework of the processes involved in self regulated learning. Social cognitive theory proposes a dynamic, interactive, and reciprocal relationship between the context (environment), person (agent), and behaviors (action). Bandura (2001) stresses the role

of human agency in the deliberative development and enactment of goal directed thoughts and actions that self reactively and self reflectively provide meaning and purpose to life pursuits and affect learning. Agency involves not only the deliberative ability to make choices and action plans, but the ability to institute appropriate courses of action that motivate and regulate their execution even in the face of obstacles and competing demands (Martin, 2004; Winne, 2004).

Self regulated actions are based in self efficacy beliefs. Positive efficacy beliefs influence the choice of behaviors that are directed towards self development and self renewal. Positive self efficacy beliefs promote flexibility of regulating learning behaviors and mobilize effort towards goal completion. Positive self efficacy perceptions are predictive of self regulatory success (Bandura, 1996).

A person is described as a proactive and reactive sentient being who sets purposeful goals developed partially from personal attributes. A person's self directive thoughts are linked through situationally specific knowledge, motivation, values, emotions, and efficacy beliefs. Personal attributes act as behavioral incentives towards goal directed actions (Bandura, 2001; Schunk, 2008). Personal attributes and previous experiences in classroom social environments dynamically created by the teacher and learner mediate the present day social learning environment (Winne, 2004). Cognitive or mental representations of environment (perceptions) affect behaviors and are bolstered or inhibited by personal attributes and external motivating factors (Bandura, 1997, 2001).

Environment refers to contextual factors that affect a person and personal behaviors. Broad networks of social systems provide the context in which agentic transactions occur. The physical learning environment, environmental regulations, social environmental norms, and events that are external to the learner provide situational opportunities or constraints for actions. Personal management of external resources is obtained through learner regulatory behavior strategies that regulate effort, time, and social interaction with faculty and peers. Sociocultural influences provide sources of external feedback that promote or inhibit competencies towards goal attainment.

Core features of social cognitive agency include intention, forethought, and self reactivity (Bandura, 2001). Intention and forethought, as self motivating, proactive guides of present and future action, are mediated by previous behaviors and experiences (Zimmerman, 2002). Through intention and forethought, a person sets purposeful goals that result in adaptive actions that are self satisfying and positively impress others (Zimmerman, 2008). Self reactive judgments regarding goal attainment, gleaned from metacognitive observation, evaluation, reflection, monitoring, and planning regulate adaptive actions.

The model for this research (see Figure 1) is derived from social cognitive theory, as well as the reviews of previous research related to self regulatory learning in higher education and characteristics of students enrolled in traditional and accelerated baccalaureate nursing programs. The model illustrates the dynamic, goal oriented interaction between the learner, learning environment, and adaptive learning behaviors

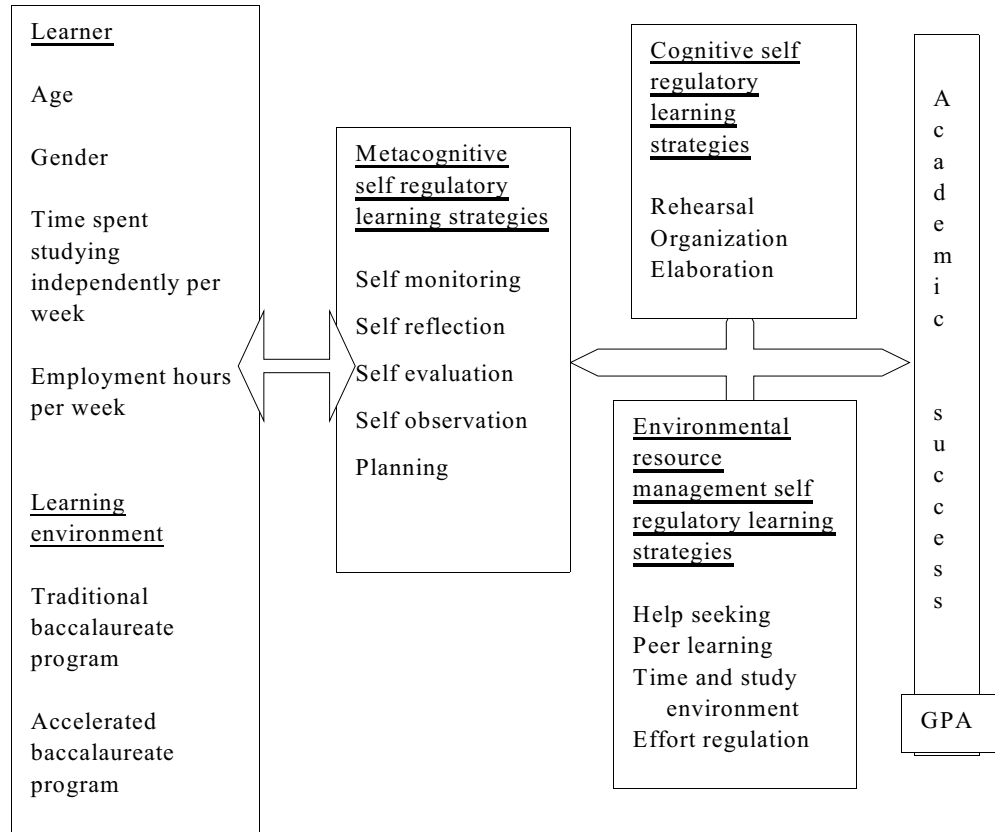


Figure 1. Model of self regulatory learning in baccalaureate nursing programs.

(SRL strategies). Learner and environmental attributes are expressed through metacognitive SRL strategies, which precipitate the use of adaptive cognitive and environmental resource management SRL strategies to achieve learning goals. Feedback regarding the effectiveness of cognitive and environmental resource

management SRL strategy use employed by learners to achieve academic goals is mediated by metacognitive SRL strategies.

This study primarily sought to explore whether differences in learner demographics and the diversity of the learning environment to which these nursing students were exposed produced distinctive differences in adaptive metacognitive, cognitive, and environmental resource management SRL strategy use. Learner variables of age and gender were chosen to be examined for their effect on the use of SRL strategies due to their impact on the use of SRL strategies in previous research studies in higher education (Akgun & Ciarrochi, 2003; Archer et al., 1999; Bidjerano, 2005; Bruinsma, 2004; Jakubowski & Dembo, 2002; McKenzie & Gow, 2004). Hours spent studying independently were significantly associated with cognitive and environmental resource management self regulatory strategy use in a pilot study involving students enrolled in an accelerated baccalaureate nursing program. Family obligations, such as marital status and number of dependents, were not significantly associated with the use of SRL strategies in the same study (Mullen, 2007). Learner nursing course GPA is typically regarded as a measure of academic success in both types of baccalaureate nursing programs.

Hours of employment per week were added as a learner variable to study the effect of ostensible time constraints on SRL strategy use by students who were employed during their course of study in traditional and accelerated baccalaureate nursing programs. Further, differences were believed to exist between students enrolled in accelerated and traditional baccalaureate nursing programs related to

employment. Most students in accelerated baccalaureate nursing programs are instructed by faculty not to work in outside employment due to the accelerated pace and intensity of their nursing program (Meyer et al., 2006; Siler et al., 2006; Suplee & Glasgow, 2008). No such guidance is generally placed on students enrolled in traditional baccalaureate nursing programs.

### Summary

A synthesis of the reviewed empirical studies provides insight into the international interest and importance of learner self regulation (via the use of SRL strategies) to academic success. Articles reviewed represented examination of students enrolled in higher education on four continents. The results of the research studies provide fairly consistent direct or indirect association of SRL strategy use and academic success. Although international investigation of SRL is supported by varied theoretical frameworks, it is generally accepted that the learner is an active agent in any learning endeavor. Consistent with social cognitive learning theory, the contributions and interrelationships of personal and environmental variables to metacognitive direction of cognitive and environmental resource management SRL strategies have been documented in the literature.

Due to the general lack of sample demographic information presented, it was impossible to determine the effect of work experience, program of study, and time spent studying independently on SRL strategy use in the reviewed studies. Objectivity of findings was threatened by the almost standard use of self report instruments and, to a lesser extent, self report of achievement outcomes. Even though the sample size

tended to be large in most studies, power analysis to determine sample size was never reported. Effect size was reported infrequently.

A critical review and examination of the research, however, also exposes fundamental sources of possible theoretical, methodological, and measurement error. Limitations of note uncovered in this synthesis were the lack of a consistent definition of SRL as well as inconsistencies in instrument nomenclature for SRL strategy variables, which are defined similarly across studies. It is the responsibility of educational researchers to examine and report the conceptual linkages within the construct of SRL in hopes of arriving at a more consistent model.

## CHAPTER III

### METHODOLOGY

#### Overview

The purpose of this descriptive, exploratory study was to delineate and compare the types and use of metacognitive, cognitive, and environmental resource SRL strategy use of students enrolled in traditional and accelerated baccalaureate nursing programs. Comparison of the self reported use of a metacognitive strategy variable, three cognitive SRL strategy variables, and four environmental resource SRL strategy variables was made between the two student groups. Associations of learner variables with metacognitive, cognitive, and environmental resource learning strategy use was established. This chapter describes the research design, sample, sampling methods, instruments, and procedures of the study.

#### Research Design

This study used a descriptive, exploratory research design to examine and compare the types of learner SRL strategy use by students enrolled in two separate learning environments, namely, traditional and accelerated baccalaureate nursing programs. It further examined the association of learner variables of age, self reported GPA, number of hours spent studying independently per week, and amount of hours worked per week to SRL strategy use.



## Measures and Instrument

The MSLQ (Pintrich, Smith, Garcia, & McKeachie, 1991) is a self report instrument designed to assess motivation orientations and learning strategy use in academic settings. The MSLQ was developed by formal research undertaken over a three-year period at the University of Michigan. During this time, survey items were tested on almost 2,000 students enrolled in multiple disciplines in higher education. Through this process, the conceptual model and survey items were refined. The final version was published by the National Center for Research to improve postsecondary teaching and learning in 1991 (Pintrich et al., 1991). The MSLQ has since been translated into several languages and used by educational researchers on five continents (Duncan & McKeachie, 2005).

Subscale factorial validity was established by exploratory factor analysis with correlations of items to factors ranging from .44 to 0.89. Factor analysis of learning strategy items to subscale factors ranged from .17 to .90 (both extremes reported for the help seeking factor). Confirmatory factor analysis and goodness of fit statistics (RMR & CN statistics) confirm recognition and good fit of observed to latent factors (Pintrich et al., 1991). A pattern of research findings have supported the internal consistency, predicative validity, and construct validity of the MSLQ (Garcia & Pintrich, 1994; Hancock, 2002; Hofer & Yu, 2003; Pintrich et al., 1991).

Reliability of the learning scales of the MSLQ has been widely established. Initial internal consistency of learning subscales ranges from 0.52 (help seeking) to 0.79 (metacognitive). Reliability of subscale scores may be affected by the lack of

anchoring of all responses because responders may not have a common reference point to evaluate each item (Gable, 1998). In a pilot research study that examined the SRL strategy use of students enrolled in an accelerated baccalaureate nursing program, internal consistency of the learning strategy subscales ranged from 0.64 to 0.84 (Mullen, 2007). Reliability of learning subscales is similar to reports in other research (Bidjerano, 2005).

Eight of nine learning strategy subscales were adapted for use in this study. The instrument used for this study is a 45-question paper and pencil questionnaire (see Appendix A). Evaluation of metacognitive and cognitive SRL strategy use for this study was accomplished using the metacognitive, rehearsal, organization, and elaboration learning subscales of the MSLQ. Evaluation of the environmental resource management SRL strategy use was accomplished by using the help seeking, peer learning, effort regulation, and time and study environment learning subscales.

Students responded to items according to a 7-point Likert scale (1 = not at all true of me to 7 = very true of me) within their nursing courses. Mean subscale scores were used for analysis. High scores for the learning scale indicated the students exhibited more of the behaviors in their nursing coursework that each of the subscales was trying to assess.

The critical thinking subscale of the MSLQ was not used in this study. Although the inclusion of critical thinking is required in the curricula of all types of nursing education by accrediting bodies of nursing programs, there is a lack of consistent research support related to the abilities of students to learn critical thinking

or that critical thinking supports clinical competence (Brunt, 2005). Multiple, vague definitions of critical thinking exist that commonly involve metacognitive monitoring and regulating activities (Riddell, 2007). It is believed, therefore, that inclusion of the critical thinking subscale might have confounded results of the present study.

### *Metacognitive Self Regulatory Learning Strategies*

Metacognition refers to activities used to plan, monitor, and regulate the use of other learning strategies. Planning activities such as goal setting and task analysis activate relevant aspects of prior knowledge that assist in organizing and comprehending new learning. Monitoring activities include tracking attention during class periods and while studying, self testing, and questioning. Regulating activities include checking and adjusting behaviors to meet previously set goals (Pintrich et al., 1991).

2. During class time I often miss important points because I'm thinking of other things. (REVERSED)

5. When reading for nursing classes, I make up questions to help focus my reading.

9. When I become confused about something I'm reading for my nursing courses, I go back and try to figure it out.

12. If course materials are difficult to understand, I change the way I read the material.

20. Before I study new course material thoroughly, I often skim it to see how it is organized.

21. I ask myself questions to make sure I understand the material I have been studying in class.

22. I try to change the way I study in order to fit the course requirements and the instructor's teaching style.

23. I often find that I have been reading for class but don't know what it was all about. (REVERSED)

27. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying.

38. When studying for nursing classes I try to determine which concepts I don't understand well.

40. When I study for nursing classes, I set goals for myself in order to direct my activities in each study period.

41. If I get confused taking notes in classes, I make sure I sort it out afterwards.

### *Cognitive Self Regulatory Learning Strategies*

#### *Rehearsal*

Rehearsal activities involve making lists of important terms or naming items from a learner created list. These activities are believed to influence attention and encoding processes and to activate short term or working memory (Pintrich et al., 1991).

7. When I study for nursing classes, I practice saying the material to myself over and over.

14. When studying for nursing classes, I read my class notes and the course readings over and over again.

25. I memorize key words to remind me of important concepts in my nursing courses.

45. I make lists of important terms from my nursing courses and memorize the lists.

#### *Organization*

Organization strategies such as outlining, selecting main ideas within printed instructional materials or class notes, and clustering of relevant information actively

involve the student in the learning task. Organization assists the learner to connect information to be learned (Pintrich et al., 1991).

1. When I study the readings for nursing courses, I outline the material to help me organize my thoughts.

10. When I study for nursing courses, I go through the readings and my class notes and try to find the more important ideas.

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

29. When I study for nursing courses, I go over my class notes and make an outline of important concepts.

### *Elaboration*

Elaboration strategies including paraphrasing, summarizing, creating analogies, and generative note taking assist students in making internal connections and integrating new learning with prior knowledge (Pintrich et al., 1991).

19. When I study for nursing classes, I pull together information from different sources, such as lectures, readings, and discussions.

28. I try to relate ideas from one nursing class to those in other nursing classes whenever possible.

30. When reading for nursing courses, I try to relate the material to what I already know.

32. When I study for nursing classes, I write brief summaries of the main ideas from the readings and the concepts from the lectures.

34. I try to understand the material in my nursing classes by making connections between the readings and the concepts from the lectures.

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

*Environmental Resource Management  
Self Regulatory Learning Strategies*

*Help Seeking*

Help seeking involves engaging the assistance of teachers or peers when the student has identified a need for clarification of concepts to be learned (Pintrich et al., 1991).

- 8. Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone. (REVERSED)
- 24. I ask instructors to clarify concepts I don't understand well.
- 33. When I can't understand the material in nursing classes, I ask another student in the class for help.
- 37. I try to identify students in my nursing classes whom I can ask for help if necessary.

*Peer Learning*

Peer learning involves formal or informal collaboration with peers regarding course materials that assists the learner to reach insights they would not be able to reach on their own (Pintrich et al., 1991).

- 4. When studying for nursing courses, I often try to explain the material to a classmate or friend.
- 13. I try to work with other students from my nursing classes to complete the course assignments.
- 17. When studying for nursing classes, I often set aside time to discuss course material with a group of students from my class.

### *Effort Regulation*

Effort regulation involves the students' ability to control their attention and energy directed towards learning and attention in the face of competing concerns or uninteresting learning task demands (Pintrich et al., 1991).

6. I often feel so lazy or bored when I study for nursing classes that I quit before I finish what I planned to do. (REVERSED)

15. I work hard to do well in nursing classes even if I don't like what we are doing.

26. When course work is difficult, I give up or only study the easy parts. (REVERSED)

36. Even when course materials are dull and uninteresting, I manage to keep working until I finish.

### *Time and Study Environment*

Time management involves scheduling, planning, and managing study time, including class attendance. Management of the study environment involves learner actions to create an environment conducive to studying and focusing on course materials to be learned (Pintrich et al., 1991).

3. I usually study in a place where I can concentrate on my coursework.

11. I make good use of my study time for all nursing courses.

18. I find it hard to stick to a study schedule. (REVERSED)

31. I have a regular place set aside for studying.

35. I attend class regularly.

39. I often find that I don't spend very much time on nursing coursework because of other activities. (REVERSED)

42. I rarely find time to review my notes or readings before an exam.  
(REVERSED)

44. I make sure I keep up with weekly readings and assignments for my nursing courses.

### Sample Recruitment

Deans or directors of public and private universities who enrolled students in both traditional and accelerated baccalaureate nursing programs were contacted by telephone and e-mail to request permission for school participation in the study (Appendix B). Students from three private and three public universities, located from the Mountain west to the Northeast coast of the United States, comprised the sample for this study. The universities each identified from 110 to 140 campus-based students enrolled in their traditional and accelerated baccalaureate nursing programs who met the inclusion criteria for the present study. An expedited human subject's approval, consistent with the policies related to approval for human subjects use for a non-interventional study was obtained from the institutional review board from every school agreeing to participate and from the university sponsoring the research.

A small to moderate effect size (Cohen's  $d = 0.3$ ) was chosen for this study, which is consistent with effect size published for most reviewed studies. A power analysis revealed that a study with 80% power to detect differences between the groups and a designated criterion for statistical significance of  $p < 0.05$  would require 176 students per group (Faul, Erdfelder, Lang, & Buckner, 2007; J. W. Wu, personal communication, November 7, 2007). Rate of survey return was anticipated to conser-



vatively be 60%. Sample size was adjusted to allow for rate of return (Salant & Dillman, 1994).

### Procedure

After appropriate institutional review board approval was obtained, paper copies of the 45 questions derived from the learning strategies subscales of the MSLQ and 5 demographic questions were sent to a designated person/persons at each university who were to administer or oversee the distribution of surveys to the students consistent with school guidelines for protection of student subjects participating in research. The researcher provided a cover letter explaining the procedure to the survey administrator (see Appendix C). A \$10 gift card was enclosed in the packet for the survey distributor consistent with procedures for survey distribution. The researcher also provided a written sheet with a brief verbal introduction to the research (see Appendix C) and consent forms (see Appendix D) for the students to read. All students were informed that participation in the study was voluntary and would not affect their grade or standing in the class in which the survey was administered.

After consent was obtained, students were instructed to complete the learning strategies subscales of the MSLQ and demographic questionnaire. Learner demographic information elicited from the questionnaire included age, gender, present self reported GPA in nursing courses, number of hours spent studying independently per week, and number of hours spent in employment per week. Students were instructed to answer the MSLQ learning strategies subscales based on their beliefs concerning nursing coursework taken in their traditional or accelerated baccalaureate nursing

program. All university designees returned surveys via prepaid envelopes to the researcher for data analysis (Salant & Dillman, 1994).

### Sample

Universities and colleges with both traditional and accelerated baccalaureate nursing programs were initially identified for this study by their stated interest in research regarding students in accelerated baccalaureate nursing programs. A convenience sample was obtained from a national cohort of (a) nursing students enrolled in a nursing course within the last semester of study in a traditional baccalaureate nursing program and (b) students enrolled in a nursing course in their last semester of study in an 11- to 13-month accelerated baccalaureate nursing program. It was believed that students enrolled in their last semester would have established their patterns of SRL strategy use, which led to their present academic success within their respective baccalaureate nursing programs. A list of schools with accelerated baccalaureate nursing programs served as a secondary source for recruitment (American Association of Colleges of Nursing, 2007a).

The sample is comprised of 288 students enrolled in a traditional baccalaureate nursing program and 226 students enrolled in a 12-month accelerated baccalaureate nursing program. Survey response rate was calculated to be 72%. No more than 5% of the data were missing from any variable. Missing cases were not included in the analyses.

## Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 16. Descriptive analyses (frequency, mean, standard deviation, and range) were assessed for all variables. Normality was assessed for all variables by inspection of scatter plots (see Appendix E) and histograms and the Kolmogorov-Smirnov (K-S) test with a significance level of  $p < .001$ . Cronbach's alpha internal consistency reliability was estimated for all outcome variable multiple item scales of the MSLQ. For variables with a distribution that varies from a normal distribution, the variable was transformed appropriately using a Box Cox optimum transformation in order to meet the normality assumption for parametric tests (National Institute of Standards and Technology, 2006).

Descriptive statistics were used to describe the characteristics of the study population. Analysis of variance (ANOVA) was performed initially to detect differences in strategy outcomes and demographic characteristics between the two groups. A multivariate analysis of covariance (MANCOVA) was performed to detect differences between the groups in their use of SRL strategies in relation to demographic variables. A follow-up one-way ANOVA with post hoc Bonferroni tests was analyzed to detect significant differences between groups in their use of SRL strategies. Relationships among student use of SRL strategies and their self reported GPA was examined using multiple regression techniques (Munro, 2005; Tabachnick & Fidell, 2007).

## CHAPTER IV

### RESULTS

#### Overview

This chapter presents the results of statistical testing completed on the research data set. Instrument reliability and validity are discussed. Differences between group means regarding student use of metacognitive, cognitive, and environmental resource management SRL strategies are delineated. The main effect of demographic factors of age, study hours, and work hours on the use of SRL strategies is examined.

#### Instrument Reliability

Table 1 shows Cronbach's alpha of the metacognitive and cognitive subscales ranged from 0.55 (rehearsal) to 0.73 (metacognitive). Cronbach's alpha of the environmental resource management subscales ranged from 0.58 (help seeking) to 0.75 (peer learning and time and study environment). Reliability coefficients closely resembled the previously published Cronbach's alpha levels for each subscale. These findings suggest consistency in the subjects' report of their use of environmental resource management SRL strategies.

Descriptives of strategy use by students enrolled in traditional and accelerated baccalaureate nursing education programs are displayed in Tables 2 and 3.

Table 1

*Internal Consistency Reliability of Motivated Strategies for Learning Questionnaire (MSLQ) Subscales for Present Study*

| Subscale                          | Items | Cronbach's $\alpha$ |
|-----------------------------------|-------|---------------------|
| Cognitive                         |       |                     |
| Rehearsal                         | 4     | 0.55                |
| Organization                      | 4     | 0.65                |
| Elaboration                       | 6     | 0.75                |
| Metacognitive                     | 12    | 0.73                |
| Environmental resource management |       |                     |
| Help seeking                      | 4     | 0.58                |
| Peer learning                     | 3     | 0.75                |
| Effort regulation                 | 4     | 0.65                |
| Time and study environment        | 8     | 0.75                |

Table 2

*Descriptive Statistics of Student Use of Metacognitive and Cognitive Self Regulated Learning (SRL) Subscales of the Motivated Strategies for Learning Questionnaire (MSLQ) by Program Option*

| Subscale      | Items | Program     | <i>N</i> | Range   | <i>M</i> | <i>SD</i> |
|---------------|-------|-------------|----------|---------|----------|-----------|
| Cognitive     |       |             |          |         |          |           |
| Rehearsal     | 4     | Traditional | 288      | 8 - 28  | 18.96    | 3.96      |
|               |       | Accelerated | 225      | 4 - 27  | 18.54    | 4.30      |
| Organization  | 4     | Traditional | 287      | 6 - 28  | 17.60    | 5.02      |
|               |       | Accelerated | 226      | 6 - 28  | 18.03    | 4.63      |
| Elaboration   | 6     | Traditional | 287      | 12 - 42 | 29.44    | 5.92      |
|               |       | Accelerated | 225      | 17 - 42 | 31.00    | 5.09      |
| Metacognitive | 12    | Traditional | 285      | 26 - 82 | 53.66    | 9.80      |
|               |       | Accelerated | 222      | 31 - 76 | 55.98    | 7.89      |

Table 3

*Descriptive Statistics and Scale for Environmental Resource Management Subscales of the Motivated Strategies for Learning Questionnaire (MSLQ)*

| Subscale                   | Items | Program     | <i>N</i> | Range    | <i>M</i> | <i>SD</i> |
|----------------------------|-------|-------------|----------|----------|----------|-----------|
| Help seeking               | 4     | Traditional | 287      | 5.5 - 28 | 18.20    | 4.43      |
|                            |       | Accelerated | 226      | 4 - 28   | 18.51    | 4.03      |
| Peer learning              | 3     | Traditional | 286      | 3 - 21   | 12.08    | 4.31      |
|                            |       | Accelerated | 225      | 3 - 21   | 12.38    | 4.39      |
| Effort regulation          | 4     | Traditional | 288      | 8 - 28   | 22.14    | 3.74      |
|                            |       | Accelerated | 225      | 11 - 28  | 22.05    | 3.63      |
| Time and study environment | 8     | Traditional | 285      | 19 - 56  | 40.24    | 7.07      |
|                            |       | Accelerated | 223      | 22 - 56  | 41.42    | 6.86      |

### Sample Demographics

Demographic information from the student sample is displayed in Table 4. A one-way ANOVA was completed to compare mean scores between the two groups of students on the demographic variables. The students enrolled in the accelerated

Table 4

*Learner Demographic Information of Study Sample*

| Demographic                                    | Program     | <i>N</i>      | Range     | <i>M</i> | <i>SD</i> |
|--|-------------|---------------|-----------|----------|-----------|
| Age  | Traditional | 285           | 20 - 47   | 24.24    | 5.17      |
|  | Accelerated | 224           | 21 - 64   | 29.81    | 6.92      |
| Gender   | Traditional | 288           |           |          |           |
|  |             | Females 91%   | 264       |          |           |
|  | Males 9%    | 24            |           |          |           |
|  | Accelerated | 225           |           |          |           |
|  |             | Females 86.3% | 194       |          |           |
|  |             | Males 13.7%   | 31        |          |           |
| Self reported GPA<br>in nursing courses        | Traditional | 279           | 2.5 - 4.0 | 3.48     | 0.31      |
|  | Accelerated | 219           | 2.8 - 4.0 | 3.58     | 0.31      |
| Hours spent studying<br>independently per week | Traditional | 278           | 0 - 65    | 10.67    | 9.70      |
|  | Accelerated | 223           | 0 - 60    | 15.61    | 10.24     |
| Hours worked in outside<br>employment per week | Traditional | 283           | 0 - 60    | 13.70    | 11.14     |
|  | Accelerated | 226           | 0 - 40    | 3.64     | 6.93      |



baccalaureate nursing program were significantly older than the students enrolled in the traditional baccalaureate nursing program,  $F(1,510) = 97.03, p < .001$ , studied significantly more hours per week,  $F(1,499) = 30.42, p < .001$ , and had significantly higher GPAs than their traditional counterparts,  $F(1,496) = 13.86, p < .001$ .

Students enrolled in the traditional baccalaureate nursing program worked significantly more hours per week than students enrolled in the accelerated baccalaureate nursing program,  $F(1, 507) = 153.21, p < .001$ . This was an expected response, because students in most accelerated baccalaureate nursing programs were encouraged not to work during their year of study (American Association of Colleges of Nursing, 2007b; Bentley, 2006; Suplee & Glasgow, 2008; Wink, 2005). There were significantly more males enrolled in the accelerated baccalaureate nursing programs,  $F(1,511) = 3.97, p = .048$ , that made up the sample. Gender was dropped from further analysis due to the small number of males within the sample population.

After descriptive statistics of the demographic data were further scrutinized by study of the frequencies of answers to demographic questions, the sample was divided into four groups. Students enrolled in traditional and accelerated baccalaureate nursing programs were further divided by age to control for confounding factors between age and type of baccalaureate nursing program, as well as between type of program and work and study hours. After visual inspection of demographic data by dot plot (Appendix E), the cutoff for groups was set at 23 years. Descriptive statistics for each group are displayed in Tables 5 and 6.

Table 5

*Descriptive Statistics of Demographic Variables Among Groups of Both Traditional and Accelerated Baccalaureate Nursing Students Divided by Age*

| Demographic                                 | Program     | Age  | Range     | <i>M</i> | <i>SD</i> |
|---|-------------|------|-----------|----------|-----------|
| Hours worked in outside employment per week | Traditional | < 23 | 0 - 50    | 13.24    | 0.49      |
|   | Traditional | > 23 | 0 - 40    | 14.21    | 12.76     |
|   | Accelerated | < 23 | 0 - 20    | 3.54     | 5.19      |
|   | Accelerated | > 23 | 0 - 40    | 3.61     | 7.10      |
| Hours spent studying independently per week | Traditional | < 23 | 0 - 30    | 8.32     | 5.67      |
|   | Traditional | > 23 | 0 - 65    | 16.55    | 13.90     |
|   | Accelerated | < 23 | 0 - 30    | 10.19    | 7.20      |
|   | Accelerated | > 23 | 0 - 60    | 16.15    | 10.41     |
| Self reported GPA in nursing courses        | Traditional | < 23 | 2.7 - 4.0 | 3.48     | 0.30      |
|   | Traditional | > 23 | 2.5 - 4.0 | 3.49     | 0.36      |
|   | Accelerated | < 23 | 3.0 - 3.9 | 3.59     | 0.28      |
|   | Accelerated | > 23 | 2.8 - 4.0 | 3.60     | 0.29      |

Table 6

*Descriptive Statistics of Metacognitive and Cognitive Self Regulated Learning (SRL) Strategy Among Four Groups of Traditional and Accelerated Baccalaureate Nursing Students*

| Subscale                            | Items | Program     | Range   | <i>M</i> | <i>SD</i> |
|-------------------------------------|-------|-------------|---------|----------|-----------|
| < 23 years of age ( <i>n</i> = 204) |       |             |         |          |           |
| Cognitive                           |       |             |         |          |           |
| Rehearsal                           | 4     | Traditional | 9 - 28  | 18.98    | 3.88      |
| Organization                        | 4     | Traditional | 6 - 28  | 17.37    | 4.91      |
| Elaboration                         | 6     | Traditional | 15 - 41 | 28.65    | 5.80      |
| Metacognitive                       | 12    | Traditional | 26 - 75 | 52.44    | 9.08      |
| > 23 years of age ( <i>n</i> = 76)  |       |             |         |          |           |
| Cognitive                           |       |             |         |          |           |
| Rehearsal                           | 4     | Traditional | 8 - 27  | 18.64    | 4.21      |
| Organization                        | 4     | Traditional | 9 - 28  | 18.09    | 5.60      |
| Elaboration                         | 6     | Traditional | 20 - 40 | 31.53    | 5.88      |
| Metacognitive                       | 12    | Traditional | 31 - 82 | 52.28    | 11.46     |
| < 23 years of age ( <i>n</i> = 25)  |       |             |         |          |           |
| Cognitive                           |       |             |         |          |           |
| Rehearsal                           | 4     | Accelerated | 8 - 27  | 18.70    | 4.63      |
| Organization                        | 4     | Accelerated | 9 - 26  | 17.06    | 5.01      |
| Elaboration                         | 6     | Accelerated | 20 - 40 | 29.43    | 5.64      |
| Metacognitive                       | 12    | Accelerated | 37 - 68 | 56.74    | 9.74      |
| > 23 years of age ( <i>n</i> = 192) |       |             |         |          |           |
| Cognitive                           |       |             |         |          |           |
| Rehearsal                           | 4     | Accelerated | 4 - 26  | 18.57    | 4.25      |
| Organization                        | 4     | Accelerated | 6 - 28  | 18.08    | 4.61      |
| Elaboration                         | 6     | Accelerated | 17 - 42 | 31.25    | 4.99      |
| Metacognitive                       | 12    | Accelerated | 31 - 76 | 56.08    | 7.66      |

A one-way ANOVA with post hoc Bonferroni test was then performed to analyze the differences among the four groups of students regarding hours spent studying per week, work hours per week, and GPA. Mean differences among the groups were statistically significant for study hours,  $F(3,493) = 28.51, p < .001$ , and work hours,  $F(3,493) = 46.71, p < .001$ . Post hoc testing revealed significant differences in study hours between the younger ( $< 23$ ) and the older ( $> 23$ ) traditional baccalaureate nursing students,  $M$  difference = .878,  $p < .001$ , CI = -1.2879 to -.4687, between the younger ( $< 23$ ) traditional students and the older ( $> 23$ ) accelerated baccalaureate nursing students,  $M$  difference = 1.001,  $p < .001$ , CI = -1.3020 to -.6993 and between the younger ( $< 23$ ) and the older ( $> 23$ ) accelerated baccalaureate nursing students,  $M$  difference = .661,  $p = .028$ , CI = -1.278 to -.0448.

In all analyses, older ( $> 23$ ) students enrolled in both traditional and accelerated baccalaureate nursing programs studied more hours per week than the younger ( $< 23$ ) students. A significant difference in GPA was noted between the older ( $> 23$ ) accelerated baccalaureate nursing students and the younger ( $< 23$ ) traditional baccalaureate nursing students,  $M$  difference = 1.15,  $p = .002$ , CI = 0.133 to 2.17. Significant differences noted in GPA between the students enrolled in the traditional program and students enrolled in the accelerated program in previous analyses were most likely between the older ( $> 23$ ) accelerated and younger ( $< 23$ ) traditional students.

## Research Aims and Hypotheses

### *Hypothesis 1*

H1: Students enrolled in accelerated baccalaureate nursing programs will use more metacognitive and cognitive (rehearsal, organization, and elaboration) self regulatory learning strategies than students enrolled in traditional baccalaureate nursing programs.

All student scores were above the mean score for all subscales indicating that the use of the metacognitive and cognitive SRL strategies were typical (true of me) of the students in the academic setting (see Table 2). Mean subscale scores were higher among the accelerated baccalaureate nursing program group of students in the metacognition, organization, and elaboration SRL strategies subscales. Mean scores in the rehearsal subscale were higher among students enrolled in traditional baccalaureate nursing programs than among students enrolled in accelerated baccalaureate nursing programs.

A one-way ANOVA was completed to screen for differences in the mean scores of the metacognitive and cognitive SRL strategies between the students enrolled in the traditional baccalaureate program and students enrolled in the accelerated baccalaureate program. Significant differences in mean scores on the metacognition,  $F(1,505) = 7.68, p = .006$ , and elaboration,  $F(1,510) = 10.37, p < .001$ , subscales were discerned. The first hypothesis was partially confirmed. Students enrolled in the accelerated baccalaureate nursing programs reported significantly more metacognition and elaboration SRL strategy use than their traditional baccalaureate nursing program counterparts.

## *Hypothesis 2*

H2: Students enrolled in accelerated baccalaureate nursing programs will use more environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies than students enrolled in traditional baccalaureate nursing programs.

The results of the descriptive analysis of the environmental resource management subscales of the MSLQ are displayed in Table 3. All student scores were above the mean score for all subscales indicating that the use of the environmental resource management SRL strategies were typical (true of me) of the students in the academic setting. Mean subscale scores were higher among the accelerated baccalaureate nursing program group of students in the help seeking, peer learning, and time and study environment subscales. The mean score in the effort regulation subscale was higher for students enrolled in the traditional baccalaureate nursing programs.

A one-way ANOVA was completed to screen for differences in the mean scores of the environmental resource management SRL strategies between the students enrolled in the traditional baccalaureate nursing program and students enrolled in the accelerated baccalaureate nursing program. Differences in the mean of the time and study environment subscale approached significance,  $F(1,509) = 3.58, p = .059$ . No significant differences were demonstrated in the use of environmental resource management strategies of help seeking, peer learning, effort regulation, and time and study environment between students enrolled in both the traditional and accelerated baccalaureate nursing programs. Thus, the second hypothesis was rejected. No significant differences were found in use of environmental resource management between students enrolled in traditional programs and students enrolled in accelerated

programs. Students enrolled in both the traditional and accelerated baccalaureate programs use environmental resource management SRL strategies to achieve goal realization.

### *Hypothesis 3*

H3: Students enrolled in accelerated baccalaureate nursing programs who are older, spend more time studying independently, and spend less time working per week will use more metacognitive and cognitive (rehearsal, organization, and elaboration) self regulatory learning strategies than students enrolled in traditional baccalaureate nursing programs who are younger, spend less time studying independently, and spend more time working per week.

Descriptive statistics for the use of metacognitive and cognitive SRL strategies by the four groups of students are described in Table 6. A one-way between subjects multivariate analysis of covariance (MANCOVA) (four-group) was conducted on student use of four dependent variables: metacognition, rehearsal, organization, and elaboration SRL strategies. The independent categorical variable was student group by age. Study hours and work hours were entered as covariates to control for their effect on the dependent variables. Transformed variables were used for this analysis. A limitation of this analysis was that it assumed that the effect of study hours did not vary by group.

For the overall MANCOVA, all multivariate tests were statistically significant for the effect of group and study hours on the use of metacognitive and all cognitive SRL strategies. The main effect of group on the use of metacognitive and cognitive SRL strategies was statistically significant, Wilk's  $\Lambda = .925$ ,  $F(12,480) = 3.16$ ,  $p < .001$ . The corresponding effect size of  $\eta_p^2 = .026$  corresponds to a small effect size. The main effect of study hours on the use of all cognitive and metacognitive SRL

strategies was statistically significant, Wilk's  $\lambda = .942$ ,  $F(1,488) = 7.320$ ,  $p < .001$ . The corresponding effect size of partial  $\eta_p^2 = .058$  corresponded to a moderate effect size (see Table 7).

Table 7

*Multivariate and Univariate ANOVA for Metacognitive and Cognitive Self Regulatory Learning (SRL) Strategy Use*

| Source      | Multivariate<br>$F(12,480)$ |               | Univariate<br>$F(3,499)$ |              |             |
|-------------|-----------------------------|---------------|--------------------------|--------------|-------------|
|             |                             | Metacognitive | Cognitive                |              |             |
|             |                             |               | Rehearsal                | Organization | Elaboration |
| Group       | 3.16*                       | 7.33*         | 0.59                     | 1.58         | 7.33*       |
| Study hours | 12.84                       | 41.23         | 22.25                    | 32.92        | 19.34       |

\* $p < .05$ .

Univariate ANOVAs were conducted on each dependent measure separately to determine the locus of the statistically significant multivariate effect. The results demonstrated that group had an effect on the use of metacognition and elaboration when controlling for study time and work hours. Study hours had an effect on the use of metacognitive and all cognitive SRL strategies.



Although comparison of the groups of students enrolled in traditional baccalaureate programs and students enrolled in accelerated baccalaureate programs demonstrated that the entire accelerated group used significantly more metacognitive and cognitive (elaboration) SRL strategies than all students enrolled in the traditional baccalaureate nursing programs, post hoc Bonferroni tests suggested that younger (< 23) students enrolled in traditional baccalaureate nursing programs used significantly less metacognitive and elaboration strategies than the older (> 23) students enrolled in both traditional and accelerated baccalaureate nursing programs (see Table 8). Thus, the use of metacognitive and cognitive (elaboration) SRL strategies are associated with student age more than type of program. Adult students from both programs used more metacognitive SRL strategies to plan, monitor, and reflect on their learning environment.

Study hours also had a significant association with the use of metacognitive and all cognitive SRL strategies. The increased use of metacognition has a positive effect on older students' significantly greater amount of study time than their younger traditional counterparts. There was no significant difference found between the younger (< 23) students enrolled in accelerated programs and all three other groups of students. Although younger (< 23) students enrolled in the traditional program studied significantly less than all other groups of students, the association of the use of rehearsal and organization SRL strategy use was not significantly different among all student groups.

Table 8

*Areas of Significance in the Mean Scores and Standard Deviations for Measures of Student Use of Metacognitive and Cognitive Self Regulatory Learning (SRL) Strategies as a Function of Group by Age from MANCOVA Analysis*

| Group          | Metognitive | Cognitive |              |             |
|----------------|-------------|-----------|--------------|-------------|
|                |             | Rehearsal | Organization | Elaboration |
| Traditional    |             |           |              |             |
| Older (> 23)   |             |           |              |             |
| <i>M</i>       | 56.68*      | 18.70     | 18.27        | 31.36*      |
| <i>SD</i>      | 11.11       | 4.15      | 5.48         | 5.82        |
| Younger (< 23) |             |           |              |             |
| <i>M</i>       | 52.47       | 19.00     | 17.35        | 28.66       |
| <i>SD</i>      | 9.04        | 3.88      | 4.87         | 5.78        |
| Accelerated    |             |           |              |             |
| Older (> 23)   |             |           |              |             |
| <i>M</i>       | 56.11*      | 18.56     | 18.21        | 31.28*      |
| <i>SD</i>      | 7.67        | 4.24      | 4.62         | 4.98        |
| Younger (< 23) |             |           |              |             |
| <i>M</i>       | 55.90       | 18.15     | 16.89        | 29.81       |
| <i>SD</i>      | 9.38        | 4.89      | 4.66         | 5.35        |

\* $p < .05$ .

#### *Hypothesis 4*

H4: Students enrolled in accelerated baccalaureate programs who are older, spend more time studying independently, and spend less time working, will use more environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies than students enrolled in traditional baccalaureate nursing programs who are younger, spend less time studying independently, and spend more time working per week.

Descriptive statistics are shown in Table 9. A one-way between subjects MANCOVA (four-group) was conducted on student use of four dependent variables: help seeking, peer learning, effort regulation, and time and study environment SRL strategies. The independent categorical variable was student group by age. Study hours and work hours were entered as covariates to control for confounding effects on the dependent variables. Transformed variables (for normality using Box guided transformation) were used for this analysis.

For the overall MANCOVA, all multivariate tests were statistically significant for the main effect of study hours on environmental resource management SRL strategy use, Wilk's  $\Lambda = .923$ ,  $F(4,476) = 9.963$ ,  $p < .001$  (see Table 10). The effect size of partial  $\eta_p^2 = .077$  corresponded to a moderate effect size. Univariate ANOVAs were conducted on each dependent measure separately to determine the locus of the statistically significant multivariate effect. Statistically significant associations were noted regarding the main effect of hours spent studying per week and the use of effort regulation,  $F(1, 490) = 22.15$ ,  $p < .001$ , and time and study environment SRL strategies,  $F(1,490) = 38.29$ ,  $p < .001$ . The effect of study hours per week on the use of help seeking approached significance,  $F(1,490) = 3.403$ ,  $p = .066$ .

Table 9

*Descriptive Statistics of Environmental Resource Management Self Regulatory Learning (SRL) Strategy Use Among Groups of Traditional and Accelerated Baccalaureate Nursing Students Divided by Age*

| Subscale                            | Items | Program     | Range     | <i>M</i> | <i>SD</i> |
|-------------------------------------|-------|-------------|-----------|----------|-----------|
| < 23 years of age ( <i>n</i> = 204) |       |             |           |          |           |
| Help seeking                        | 4     | Traditional | 5.5 - 27  | 18.05    | 4.42      |
| Peer learning                       | 3     | Traditional | 3 - 21    | 11.94    | 4.12      |
| Effort regulation                   | 4     | Traditional | 8 - 28    | 21.74    | 3.74      |
| Time and study environment          |       | Traditional | 19 - 56   | 39.39    | 7.07      |
| > 23 years of age ( <i>n</i> = 76)  |       |             |           |          |           |
| Help seeking                        | 4     | Traditional | 6 - 28    | 18.56    | 4.57      |
| Peer learning                       | 3     | Traditional | 3 - 21    | 12.43    | 4.78      |
| Effort regulation                   | 4     | Traditional | 15 - 28   | 23.13    | 4.18      |
| Time and study environment          |       | Traditional | 25 - 56   | 42.30    | 7.07      |
| < 23 years of age ( <i>n</i> = 25)  |       |             |           |          |           |
| Help seeking                        | 4     | Accelerated | 6 - 24    | 18.15    | 4.57      |
| Peer learning                       | 3     | Accelerated | 4 - 20    | 11.54    | 12.44     |
| Effort regulation                   | 4     | Accelerated | 11 - 27.5 | 21.02    | 4.18      |
| Time and study environment          |       | Accelerated | 22 - 53   | 41.93    | 8.14      |
| > 23 years of age ( <i>n</i> = 192) |       |             |           |          |           |
| Help seeking                        | 4     | Accelerated | 4 - 28    | 18.55    | 3.99      |
| Peer learning                       | 3     | Accelerated | 3 - 21    | 12.43    | 4.39      |
| Effort regulation                   | 4     | Accelerated | 11 - 28   | 22.25    | 3.55      |
| Time and study environment          |       | Accelerated | 22 - 56   | 41.46    | 6.59      |

Table 10

*Multivariate and Univariate ANOVA for Environmental Resource Management Self Regulatory Learning (SRL) Strategy Use*

| Source     | Multivariate<br><i>df</i> (4,482) | Univariate<br><i>F</i> (3,502) |                  |                      |                             |
|------------|-----------------------------------|--------------------------------|------------------|----------------------|-----------------------------|
|            |                                   | Help<br>seeking                | Peer<br>learning | Effort<br>regulation | Time & study<br>environment |
| Study time | 21.06                             | .545                           | .771             | 4.162*               | 4.714*                      |

\* $p < .05$ .

Thus, the use of effort regulation and time and study environment SRL strategies have an association with the amount of studying completed by students. As students study more and define knowledge gaps, they also use help seeking strategies more than students who do not spend as much time reviewing course materials.

Two significant associations also emerged in group use of effort regulation and time and study environment (see Table 11). Significant differences were noted in the use of the SRL strategy of effort regulation between the older (> 23) traditional students and the younger (< 23) students enrolled in both the traditional and accelerated baccalaureate nursing programs. Significant differences were also demonstrated in the use of the SRL strategy of time and study environment between the older (> 23) students enrolled in both traditional and accelerated baccalaureate nursing programs

Table 11

*Mean Scores and Standard Deviations for Measures of Student Use of Environmental Resource Management Self Regulatory Learning (SRL) Strategies as a Function of Group by Age from MANCOVA Analysis*

| Group          | Help seeking | Peer learning | Effort regulation | Time & study environment |
|----------------|--------------|---------------|-------------------|--------------------------|
| Traditional    |              |               |                   |                          |
| Older (> 23)   |              |               |                   |                          |
| <i>M</i>       | 18.56        | 12.43         | 23.13*            | 42.30*                   |
| <i>SD</i>      | 4.63         | 4.78          | 3.61              | 6.87                     |
| Younger (< 23) |              |               |                   |                          |
| <i>M</i>       | 18.05        | 11.94         | 21.74             | 39.39                    |
| <i>SD</i>      | 4.38         | 4.12          | 3.73              | 6.99                     |
| Accelerated    |              |               |                   |                          |
| Older (> 23)   |              |               |                   |                          |
| <i>M</i>       | 18.55        | 12.50         | 22.25             | 41.46*                   |
| <i>SD</i>      | 7.67         | 4.40          | 3.50              | 4.98                     |
| Younger (< 23) |              |               |                   |                          |
| <i>M</i>       | 18.15        | 11.54         | 21.02             | 40.93                    |
| <i>SD</i>      | 4.46         | 4.42          | 4.05              | 8.40                     |

\* $p < .05$ .

and younger (< 23) students enrolled in the traditional baccalaureate nursing program. Younger (< 23) students enrolled in the traditional baccalaureate nursing program used significantly less time and study environment SRL strategies than the older (> 23) students enrolled in both the traditional and accelerated baccalaureate nursing programs.

Thus, the hypothesis was partially rejected. Both groups of students sought help from faculty or peers. Age and type of program was associated with the use of effort regulation and time and study environment SRL strategies. Older (> 23) students in both programs seemed to be most successful in the use of effort regulation and time and study management SRL strategies to generate increased amount of study time. Older (> 23) students in traditional programs used significantly more effort regulation strategies to maintain control of their learning environment than younger (< 23) students enrolled in both traditional and accelerated programs.

#### *Hypothesis 5*

H5: Use of metacognitive, cognitive (rehearsal, organization, and elaboration), and environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies and time spent studying independently will be positively predictive of student self reported grade point average.

According to Polit and Beck (2004), the more correlated the independent variables are to the criterion or dependent variable, the more accurate the results of the regression analysis. Continuous variables were, therefore, screened for significant associations according to the hypothesized conceptual model. Table 12 presents the results of the Pearson *r* correlations between MSLQ metacognitive, cognitive, and

Table 12

*Pearson r Correlations Between Motivated Strategies for Learning Questionnaire (MSLQ) Subscales and Demographic Variables*

| Subscale                          | GPA    | Study hrs | Work hrs | Program | Age    |
|-----------------------------------|--------|-----------|----------|---------|--------|
| Study hours                       | .057   |           |          |         |        |
| Work hours                        | -.126* | -.236**   |          |         |        |
| Program                           | .167** | .278**    | -.482**  |         |        |
| Age                               | .085*  | .327**    | -.298**  | .400**  |        |
| Cognitive                         |        |           |          |         |        |
| Rehearsal                         | -.064  | .175**    | -.050    | -.046   | .037   |
| Organization                      | .079*  | .261**    | -.109*   | .046    | .062   |
| Elaboration                       | .199** | .251**    | -.112*   | .141**  | .170** |
| Metacognitive                     | .175** | .316**    | -.119*   | .122**  | .166** |
| Environmental resource management |        |           |          |         |        |
| Help seeking                      | .080*  | .131*     | .030     | .030    | -.019  |
| Peer learning                     | .009   | .074      | -.009    | .032    | .014   |
| Effort regulation                 | .191** | .290**    | -.087*   | -.017   | .127** |
| Time & study environment          | .196** | .400**    | -.155**  | .084    | .184** |

\* $p < .05$ , \*\* =  $p < .001$ .



environmental resource subscale variables to the demographic variables of study hours, work hours, program type, age, and student self reported GPA. Correlations between the SRL strategy variables were in the small to moderate range in the expected direction (see Tables 13 and 14). Weak or no correlations were found between the independent demographic variables and criterion variable of GPA.

All transformed independent variables were added into the regression equation at one time, consistent with methods for standard multiple regression. The overall regression, including all independent variables, was statistically significant,  $R = .356$ ,  $R^2 = .127$ , adjusted  $R^2 = .104$ ,  $F(12,461) = 5.586$ ,  $p < .001$ . Results of the standard multiple regression are summarized in Table 15. This analysis revealed rehearsal and hours worked per week as significant negative predictors of student self reported GPA. The regression analysis further revealed that SRL strategies of elaboration and time and study environment are positive predictors of GPA. Statistical significance was also noted on program type as a positive predictor of GPA. Students enrolled in the accelerated baccalaureate nursing program had significantly higher self reported nursing GPAs than students enrolled in the traditional baccalaureate nursing program. All factors entered account for only 10% of the variance in GPA.

Table 13

*Pearson r Correlations Between Transformed Metacognitive, Cognitive, and Environmental Resource Management Self Regulatory Learning (SRL) Strategy Variables*

| Subscale                          | Cognitive |                   |                  | Metacognitive |
|-----------------------------------|-----------|-------------------|------------------|---------------|
|                                   | Rehearsal | Organi-<br>zation | Elabora-<br>tion |               |
| Cognitive                         |           |                   |                  |               |
| Rehearsal                         |           |                   |                  |               |
| Organization                      | .463*     |                   |                  |               |
| Elaboration                       | .386*     | .583*             |                  |               |
| Metacognitive                     | .434*     | .562*             | .649*            |               |
| Environmental resource management |           |                   |                  |               |
| Help seeking                      | .218*     | .252*             | .374*            | .340*         |
| Peer learning                     | .267*     | .30*9*            | .308*            | .266*         |
| Effort regulation                 | .311*     | .318*             | .404*            | .484*         |
| Time and study environment        | .433*     | .382*             | .454*            | .536*         |

\* $p < .05$ .

Table 14

*Pearson r Correlations Between Transformed Environmental Resource Management Self Regulatory Learning (SRL) Strategy Variables*

| Subscale                   | Help seeking | Peer learning | Effort regulation |
|----------------------------|--------------|---------------|-------------------|
| Help seeking               |              |               |                   |
| Peer learning              | .557*        |               |                   |
| Effort regulation          | .210*        | .036*         |                   |
| Time and study environment | .296*        | .141*         | .643*             |

*Note.* Correlation is significant at the 0.01 level (2 tailed).

\* $p < .05$ .

Table 15

*Results of Multiple Regression of Self Regulatory Learning (SRL) Strategies and Demographic Factors on Grade Point Average (GPA)*

| Independent variables             | $\beta$ | Beta  | $t$    | $p$    |
|-----------------------------------|---------|-------|--------|--------|
| Cognitive                         |         |       |        |        |
| Rehearsal                         | -.033   | -.237 | -4.490 | < .001 |
| Organization                      | -.045   | -.039 | -.655  | .513   |
| Elaboration                       | .026    | .167  | 2.659  | .008   |
| Metacognitive                     | .008    | .079  | 1.215  | .225   |
| Environmental resource management |         |       |        |        |
| Help seeking,                     | .001    | .009  | .158   | .875   |
| Peer learning                     | -.016   | -.013 | -.244  | .807   |
| Effort regulation                 | .001    | .084  | 1.428  | .154   |
| Time and study environment        | .008    | .148  | 2.284  | .023   |
| Demographics                      |         |       |        |        |
| Study hours per week              | -.168   | -.063 | -1.279 | .202   |
| Work hours per week               | -.227   | -.100 | -2.195 | .029   |
| Program type                      | .795    | .122  | 2.227  | .023   |
| Age                               | -.011   | -.023 | -.445  | .656   |

## Summary

Students enrolled in accelerated baccalaureate nursing programs reported greater use of metacognitive, cognitive (organization and elaboration), and environmental resource management (help seeking, peer learning, and time and study environment) than students enrolled in traditional baccalaureate nursing programs. Students enrolled in the traditional baccalaureate nursing programs reported greater use of rehearsal and effort regulation strategies. The students enrolled in accelerated baccalaureate nursing programs used significantly more metacognitive and elaboration SRL strategies than students enrolled in traditional baccalaureate nursing programs.

Older (> 23) students reported studying significantly more hours than younger (< 23) students enrolled in both traditional and accelerated baccalaureate nursing programs. Specifically, older (> 23) students enrolled in traditional baccalaureate nursing programs used significantly more effort regulation and time and study environment SRL strategies than both groups of younger (< 23) students. Older (> 23) accelerated baccalaureate nursing students used significantly more metacognitive, elaboration, effort regulation, and time and study environment strategies than younger (< 23) students enrolled in traditional and accelerated baccalaureate nursing programs.

There was a significant main effect of hours spent studying independently per week on the use of metacognitive, cognitive (rehearsal, organization, and elaboration), and environmental resource management (effort regulation and time and study environment) SRL strategy use. Increased study time showed a positive effect of the use of these SRL strategies (see Table 16).

Table 16

*Comparison of Means of Metacognitive, Cognitive, Environmental Resource Management Strategy Use and Demographic Factors of Study Time, Employment Hours Per Week, and Grade Point Average (GPA) by Program Type and Program Type by Age*

| Learning strategies        |                        |                        | Traditional         |                     | Accelerated         |                     |
|----------------------------|------------------------|------------------------|---------------------|---------------------|---------------------|---------------------|
|                            | Traditional<br>N = 288 | Accelerated<br>N = 226 | Older<br>> 23       | Younger<br>< 23     | Older<br>> 23       | Younger<br>< 23     |
| Metacognitive              | 53.66                  | 55.98 <sup>a*</sup>    | 56.68 <sup>a*</sup> | 52.47               | 56.11 <sup>a*</sup> | 55.90 <sup>ns</sup> |
| Rehearsal                  | 18.96                  | 18.54                  | 18.70               | 19.00               | 18.56               | 18.15               |
| Organization               | 17.60                  | 18.03                  | 18.27               | 17.35               | 18.21               | 16.89               |
| Elaboration                | 29.44                  | 31.00 <sup>a*</sup>    | 31.36 <sup>a*</sup> | 28.66               | 31.28 <sup>a*</sup> | 29.81 <sup>ns</sup> |
| Help seeking               | 18.20                  | 18.51                  | 18.56               | 18.05               | 18.58               | 18.15               |
| Peer learning              | 12.08                  | 12.38                  | 12.43               | 11.94               | 12.50               | 11.54               |
| Effort regulation          | 22.14                  | 22.05                  | 23.13 <sup>a*</sup> | 21.74 <sup>a</sup>  | 22.25               | 21.02 <sup>a</sup>  |
| Time and study environment | 40.24                  | 41.42                  | 42.30 <sup>a*</sup> | 39.39               | 41.46 <sup>a*</sup> | 40.93 <sup>ns</sup> |
| Study hours/week           | 10.67                  | 15.64 <sup>a*</sup>    | 16.55 <sup>a*</sup> | 8.32                | 16.15 <sup>a*</sup> | 10.19               |
| Work hours/week            | 13.70 <sup>a*</sup>    | 11.14                  | 14.21 <sup>a*</sup> | 13.24 <sup>a*</sup> | 3.61                | 3.54                |
| GPA                        | 3.48                   | 3.58 <sup>a*</sup>     | 3.49 <sup>ns</sup>  | 3.48 <sup>a</sup>   | 3.60 <sup>a*</sup>  | 3.59 <sup>ns</sup>  |

*Note.* ns = non significant relationship between groups.

<sup>a</sup>significant relationship between variables.

\* $p < .05$  (significantly higher mean differences).

Finally, hours spent working and the use of the cognitive SRL strategy of rehearsal were significant negative predictors of GPA. Students enrolled in the accelerated baccalaureate nursing program who spent a greater number of hours studying per week had significantly higher GPAs than the younger (< 23) group of traditional baccalaureate nursing students. The use of the SRL strategies of elaboration and time and study environment were found to be significant positive predictors of GPA.

## CHAPTER V

### DISCUSSION AND RECOMMENDATIONS

This chapter includes a discussion of the study findings as organized by the research questions. Limitations of this study are also presented. Implications for nurse educators are included. This chapter concludes with recommendations for future research.

#### Study Findings

RQ1: Are there differences in the reported use of metacognitive and cognitive (rehearsal, organization, and elaboration) self regulatory learning strategies between students enrolled in traditional baccalaureate nursing programs and in accelerated baccalaureate nursing programs?

Mean scores of students enrolled in the accelerated baccalaureate nursing program were higher for all metacognitive and cognitive SRL strategy use with the exception of rehearsal. Traditional baccalaureate nursing students reported greater use of rehearsal strategies than students enrolled in accelerated baccalaureate nursing programs. Students enrolled in accelerated baccalaureate nursing programs reported significantly greater use of metacognitive and elaboration SRL strategies than students enrolled in traditional baccalaureate nursing programs.

Differences between group mean scores were in the expected direction. It was anticipated that students who were enrolled in a more demanding accelerated baccalaureate nursing program would use more adaptive metacognitive and cognitive SRL strategies than students enrolled in a traditional baccalaureate nursing program. The use of rehearsal and organization SRL strategies was prevalent and similar among



both traditional and accelerated baccalaureate nursing groups, which may indicate that rehearsing and organizing information to be studied is a well established pattern for all students in the last semester of their baccalaureate nursing programs.

RQ2: Are there differences in the reported use of environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies between students enrolled in traditional baccalaureate nursing programs and in accelerated baccalaureate nursing programs?

Mean scores on help seeking, peer learning, and time and study environment SRL strategy subscales were higher among the students enrolled in the accelerated baccalaureate nursing program. The mean score on the effort regulation subscale was higher for students enrolled in traditional baccalaureate nursing programs. No significant differences were noted between the groups regarding the use of environmental resource SRL strategies.

This result was not fully anticipated. Due to the pace of the accelerated baccalaureate nursing course of study and previous college experience, it was believed that the students enrolled in accelerated baccalaureate nursing programs would report significantly higher use of these strategies. As previously stated, the use of these strategies is dependent upon diverse personal and social competencies. Simply testing the differences in environmental resource management SRL strategy use does not capture the full extent of variables responsible for this finding. The timing of the sampling during the last semester of their baccalaureate nursing programs may also have had an effect on these findings.

RQ3: What is the relationship of use of metacognitive and cognitive (rehearsal, organization, and elaboration) self regulatory learning strategies by students enrolled in traditional and accelerated baccalaureate nursing programs to learner age, number of hours spent studying independently, or number of hours spent working per week?

Research Question 3 sought to explore the relationship of demographic variables of group (type of program and age), hours spent studying per week, and hours spent working per week on the use of metacognitive and cognitive (rehearsal, organization, and elaboration) SRL strategies. In the omnibus test, the results of the analysis demonstrated a statistically significant association of study hours per week on the use of metacognitive and cognitive SRL strategies. From this finding, it would seem that more metacognitive SRL strategy use translates into increased study time and use of cognitive SRL strategies. Study time and concomitant increase in the use of metacognitive and cognitive SRL strategies promotes flexibility and adaptation to the academic environment (Bandalos et al., 2003).

The use of metacognitive and cognitive (elaboration) SRL strategies were associated with student age more than type of program. Age is well established in the literature as making a difference in the SRL strategy use in both the short and long term (Archer et al., 1999; McKenzie & Gow, 2004; Severeins et al., 2001). Adult students from both programs used more metacognitive SRL strategies to plan, and monitor their learning environment, and reflect upon learning and goal achievement due to increased responsibilities outside of the classroom, intrinsic and extrinsic motivation, and goal orientation. The use of metacognition had an effect on older (> 23) students' significantly greater amount of study time than their younger

counterparts. Since older (> 23) students possess more life experiences than younger (< 23) students, the significantly greater use of elaboration was expected.

There was no significant difference found between the younger (< 23) accelerated and all three other groups of students. Success in previous degree attainment by the younger (< 23) group of accelerated students may be responsible for the lack of significant differences between that group and the other groups of students. No significant associations of student group or demographic factors were found to the use of rehearsal or organization SRL strategies. A lack of significant association of group and age with student use of the cognitive SRL strategies of rehearsal and organization may be a result of the timing of the survey. Students who have been successful at completing nursing coursework have established patterns to discern and remember salient issues from classroom teaching.

Post hoc testing revealed that older (> 23) students in both baccalaureate programs studied more than younger (< 23) students enrolled in both baccalaureate nursing programs. Older (> 23) students in both programs used significantly more metacognition, elaboration, and time and study SRL strategies than the younger (< 23) group of students enrolled in traditional baccalaureate nursing programs. Supported by previous college and/or life experiences, older (> 23) students maximized their study time and environment while integrating more cognitive and metacognitive strategies. Results of this study indicate that age is a deciding factor in the significant differences found between group use of SRL strategies whether or not students possessed a previous degree in another discipline.

RQ4: What is the relationship of the use of environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies by students enrolled in traditional and accelerated baccalaureate programs to age, number of hours spent studying independently, and number of hours spent working per week?

Research Question 4 sought to explore the relationship of demographic variables of group (type of baccalaureate program and age), hours spent studying per week, and hours spent working per week to the use of environmental resource management strategies. In the omnibus test, study hours had a significant association to the use of environmental resource management SRL strategies.

In the omnibus test, hours spent studying were significantly associated with the use of the environmental resource management SRL strategies of effort regulation and time and study environment. Post hoc testing revealed that older (> 23) students in both nursing programs not only studied significantly more than younger (< 23) students, they used more goal directed persistence SRL strategies (effort regulation) to control their academic environment in spite of internal or external (hours spent working) distractions. The results of this study support the contention of older (> 23) students who believed that prior experiential learning was invaluable for the development of coping strategies that increased motivation and determination directed towards goal attainment (Hensley & Kinser, 2001).

Older (> 23) students enrolled in traditional baccalaureate nursing programs used more effort regulation than younger (< 23) students enrolled in both baccalaureate nursing programs. Older students enrolled in traditional programs may use persistence strategies when multiple competing demands outside their educational endeavor

vie for their considered attention more than younger students. Conative strategies appear to be used significantly less by the younger group of traditional students for whom hours worked may be a competing issue. For students who had completed a previous degree, the acceleration of the nursing program may force older (> 23) students, and to a degree younger (< 23) students, to maintain their focus on conative processes related to learning.

The findings of this study support prior research, which demonstrated positive effects of the use of conative strategies on concentration, the use of deep information processing strategies, and time management (Bandalos et al., 2003; Garcia et al., 1998; Ross, Salisbury-Glennon, Guarino, Reed, & Marshall, 2003). The significant difference in use of time and study environment SRL strategies between the older (> 23) students and the younger (< 23) students enrolled in the traditional baccalaureate nursing program indicates that older (> 23) students attempt to regulate their academic environment further by class attendance and careful planning and arrangement of study time and place.

RQ5: Is the use of metacognitive, cognitive (rehearsal, organization, and elaboration), and environmental resource management (help seeking, peer learning, effort regulation, and time and study environment) self regulatory learning strategies and demographic factors of type of program, age, hours spent studying per week, and hours spent working per week predictive of student self reported grade point average in nursing courses?

Multiple regressions best reveal significant relationships among variables when the independent variables are highly correlated with the dependent variable, but uncorrelated with other independent variables (Tabachnick & Fidell, 2007). It is possible that this analysis was hampered by the non association of the independent

demographic variables to the outcome variable (GPA), as well as the quality (weak to moderate) of correlations among the independent variables.

The predictive relationship between the two cognitive strategies (rehearsal and elaboration) to GPA indicates that students use deep information processing SRL strategies to achieve academic success in nursing courses rather than surface information processing strategies. Rehearsal, as a unidimensional surface information processing strategy, is associated with academic success in beginning coursework such as skills training, where rote memorization of facts and processes helps students gain basic knowledge of the discipline being studied. Since prior knowledge of the subject is necessary for deep information processing strategies use, it seems consistent that students polled in their last semester of study would achieve academic success by employing elaboration strategies in both classroom and clinical environments. It is encouraging to know that students enrolled in their final semester of both types of baccalaureate nursing options used strategies that assisted their success in the complex clinical environments that new graduates would practice.

Furthermore, the negative prediction of hours worked per week on GPA is also consistent with previously reported research (Lammers et al., 2001). The positive prediction of elaboration and the environmental resource management SRL strategy of time and study environment to GPA, as well as the non predictive role of study hours on GPA, indicated the indirect relationship of study hours to GPA as well as the significance of the quality of study time and environment to baccalaureate nursing student achievement.

The overall significance of SRL strategies on GPA showed that the uses of adaptive SRL strategies were predictive of traditional measures of academic success. SRL strategies used by nursing learners accounted for only 10% of the variance in GPA. This finding may be the result of an indirect link of metacognitive, cognitive, and environmental resource management SRL strategy use to GPA through evaluative methods employed in the baccalaureate programs (Ross et al., 2006). There was no data available regarding the methods, measures, or complexity of evaluative measures that contribute to nursing course GPA used in this national sample of nursing programs from which the sample was derived.

#### Limitations

Several limitations of this study could affect study results. The use of self report surveys may have limited objectivity of study results. Self report instruments may have been answered as students perceived what faculty or researchers may wish them to answer, which may have resulted in intentional or unintentional inflation of survey responses. Objectivity of findings may also have been threatened by the use of student self reported achievement outcomes (GPA).

Instrumentation may also have affected the results. Explanation of survey responses were only provided at both ends of the response scale. Anchoring explanations on the ends of the scales may have led to individualized interpretation of mid-scale responses that could have increased the variability of responses to survey questions. The measured reliability of the instrument used in this study, specifically

the rehearsal and help seeking subscales of the MSLQ, may have affected study results.

Millennial learners who have used computers all their lives may seek help from other resources, such as the Internet to provide assistance in learning conceptual and content information. The age of the survey may be responsible for not being able to capture student use of Internet resources that would translate into use of organization, elaboration, and/or time and study environment SRL strategies. Anecdotally, student use of computers in the classroom to access the Internet to help explain a concept seems to be increasing year after year. As the millennial and future generations come of age, and technologically savvy college age students make up the majority of students in baccalaureate nursing programs in future years, a survey that would capture student use of Internet resources and their function within the use of SRL strategies should be formulated.

There was no control over the amount of time students were given to complete the survey in their individual classes. Also, there was no control over which class students would have been attending at the time of the survey. Even though survey questions were framed around all nursing courses, students may have been answering the questions regarding SRL strategy use based on strategies that proved most useful in the present course they were taking rather than the majority of coursework in their nursing programs.

The voluntary, convenience sample used for this study was also a limitation. The participants who chose to participate in a study may have had different



characteristics than the entire populations of interest. Students may not have been able to quickly and adequately differentiate their nursing class GPAs and may have provided their cumulative GPA instead.

In spite of using transformed variables, statistical conclusion validity may have been a limitation of the study. This may be due to the inequality in the number of members in the four student groups. Even though all omnibus tests results were significant, violations of the normality assumption for parametric testing were present in the MANCOVA testing for the metacognition and elaboration subscales. Distribution of the hours worked per week and hours of study per week did not comply with the normality assumption for parametric testing due to the large number of zeros obtained for data analysis.

#### Implications for Nursing Education

Learner focused research provides an evidence based framework for recommended nursing education reform. This research has demonstrated that differences previously perceived between students enrolled in traditional and accelerated baccalaureate nursing programs extend to the adaptive strategies that students use to learn. A greater amount of working hours seems to have the greatest effect on the metacognitive, cognitive, and environmental resource management SRL strategy use in the younger (< 23) students, which make up the majority of the students enrolled in the traditional baccalaureate nursing program. Nurse educators' awareness of the needs of the younger (< 23) traditional baccalaureate nursing students to develop consistent use of metacognitive strategies, deep information processing cognitive strategies, and

full use of personal and environmental resource SRL strategies should lead them to discover methods to facilitate their use.

Nursing learning environments should encourage development of more types of metacognitive strategies such as planning, self evaluation, and self monitoring, especially for younger (< 23) students enrolled in traditional baccalaureate nursing programs. Although reflective practices have been used and studied in nursing curricula, it may benefit students who are enrolled in their primary degree program to increase the quality and quantity of their use of reflective metacognitive practices. Increasing use of SRL metacognitive strategies may increase the amount of other adaptive strategies that younger (< 23) students use.

Nurse educators could enhance student use of metacognitive and cognitive SRL strategies by increasing their own and their students' awareness of their personal approaches to learning. Faculty may be able to increase the types and use of metacognitive and cognitive SRL strategies used by students enrolled in both types of baccalaureate nursing education programs by using methods of teaching that promote student learning through deep information processing strategies in the classroom and simulation centers. Students should be encouraged to share their organizing and elaborative strategies with their fellow students through teacher led active class discussions that could be accomplished through group work in the classroom. The use of current and future technology could further enhance the availability of study time and SRL strategy use.

Nurse educators can heighten the use of resource management SRL strategies by their promotion of a supportive, collaborative, and cohesive academic environment in classroom and clinical settings in both traditional and accelerated baccalaureate nursing programs. Younger (< 23) traditional baccalaureate nursing students may benefit from teaching strategies that encourage an increased quality of study time possible. All students may benefit from a focus on time and study management strategies by nursing faculty. In light of findings from the present study, older (> 23) students enrolled in traditional programs may perform better in mixed traditional-accelerated classrooms than younger (< 23) students enrolled in traditional baccalaureate nursing programs.

Nursing students must become self regulated learners to prepare for the complexity of patient care in the present day and future healthcare environments. The increased complexity of nursing education, caused by shifting student demographics, presents ongoing challenges for nurse educators. The current economic crisis may increase the complexity for students enrolled in traditional and accelerated baccalaureate nursing education programs and may have a negative effect on the learning strategies of students who must adapt not only to curricular demands, but also to increasing personal financial demands.

#### Race, Ethnicity, and Income of Students in Baccalaureate Nursing Programs

As nursing education continues to seek matriculation and graduation of a more diverse student body to mimic that of the general population, programs may have to be conceived and established that support both increased access and success of diverse

student populations. Students who use English as a Second Language (ESL) may need to have an orientation regarding learning strategies that would lead to academic success. Assessment of learning strategy use by ethnically diverse adult and traditional age college students may confirm the need for pre nursing college support classes. Improved and up to date student counseling, increased flexibility of course schedules, and more fluid movement between program options may better support the academic aspirations of an increasing population of ethnically diverse/economically challenged groups of future nursing students. Political action taken by nursing education organizations may be required to change policies related to creating financial incentives for adoption of these programs as well as to provide opportunities for ethnically diverse students to enter professional life.

#### Recommendations for Future Research

In light of these findings, further study on the SRL strategy use of students in both types of baccalaureate nursing programs should be accomplished to discern if and when strategy use may change over time. Mixed method research undertaken to examine the types and amount of strategy use by students in the face of competing demands should be accomplished. Information gained from this study could help nurse educators better understand and respond to present and future demands placed on students enrolled in both types of baccalaureate nursing education.

Consistent with the triadic relationship of person, environment, and learning in Bandura's social cognitive learning model, future research should continue to focus on the effects of learner variables, environment, and learning strategies on learning in

nursing education. The present study focused on the effects of the environmental variable of type of program and the learner characteristics of age, time spent studying independently, and hours of employment per week on the use of SRL strategies by a sample of nursing students enrolled in traditional and accelerated baccalaureate nursing education programs. Further research should be undertaken to delineate the effect of learner variables such as racial and ethnic diversity, motivation, efficacy, goal orientation, expectancy, learning attributions, conation, and values on all types of SRL strategy use.

Exploration into environmental and technological resources accessible to students within each type of baccalaureate nursing program should be accomplished. Research into other environmental variables, such as extent of class hours, class size, physical environment of the classroom, and use of Internet search engines would further focus on the effect of the environment on the learner and learning. Investigation may reveal environmental conditions and resources that facilitate use of SRL strategies. Inventories used to measure environmental management SRL strategies need to be updated to reflect those changes in future studies.

In order to advance the scholarship of teaching and optimize the learning environment, research should be accomplished that investigates the effect of different androgogical approaches on SRL strategy use of nursing students. Research into teaching methods that would further engage students and increase the use of metacognitive strategies, deep processing cognitive strategies, and environmental resource SRL strategies should be examined. Further study of the association of

metacognition to elaboration could assist nurse educators to assist students to perceive connections between patient context and process within the nursing curriculum.

APPENDIX A

LEARNING STRATEGIES AND DEMOGRAPHIC SURVEY

## LEARNING STRATEGIES AND DEMOGRAPHIC SURVEY

### Comparison of Students Enrolled in Traditional and Accelerated Baccalaureate Degree Nursing Programs Use of Academic Self Regulatory Learning Strategies

**DIRECTIONS:** As you read the following questions, think of the actions you take to help you to learn. Please place an X on the line at the place that best describes the learning behaviors that you have used and presently use in your nursing courses:

1. When I study the readings for nursing courses, 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 \_\_\_\_\_

2. During class-time I often miss important points because I'm thinking of other things.

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

3. I usually study in a place where I can concentrate on my coursework.

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

4. When studying for nursing courses, I often try to explain the material to a classmate or a friend.

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

5. When reading for nursing classes, I make up questions to help focus my reading.

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



6. I often feel so lazy or bored when I study for nursing classes that I quit before I finish what I planned to do.

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

7. When I study for nursing classes, I practice saying the material to myself over and over.

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

8. Even if I have trouble learning the material in nursing class, I try to do the work on my own, without help from anyone.

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

9. When I become confused about something I'm reading for my nursing courses, I go back and try to figure it out.

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

10. When I study for nursing courses, I go through the readings and my class notes and try to find the most important ideas.

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

11. I make good use of my study time for all nursing courses.

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

12. If course materials are difficult to understand, I change the way I read the material.

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

13. I try to work with other students from my nursing classes to complete course assignments.

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

14. When studying for nursing classes, I read my class notes and the course readings over and over again.

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

15. I work hard to do well in nursing classes even if I don't like what we are doing.

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

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

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

17. When studying for nursing classes, I often set aside time to discuss course materials with a group of students from my class.

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

18. I find it hard to stick to a study schedule.

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

19. When I study for nursing classes, I pull together information from different sources, such as lectures, readings, and discussions.

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

20. Before I study new course material thoroughly, I often skim it to see how it is organized.

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

21. I ask myself questions to make sure I understand the material I have been studying in class.

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

22. I try to change the way I study in order to fit the course requirements and the instructor's teaching style.

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

23. I often find that I have been reading for class but don't know what it was all about.

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

24. I ask instructors to clarify concepts I don't understand well.

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

25. I memorize key words to remind me of important concepts in my nursing courses.

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

26. When course work is difficult, I give up or only study the easy parts.

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

27. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying.

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

28. I try to relate ideas from one nursing class to those in other nursing classes whenever possible.

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

29. When I study for nursing courses, I go over my notes and make an outline of important concepts.

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

30. When reading for nursing courses, I try to relate the material to what I already know.

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

31. I have a regular place set aside for studying.

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

32. When I study for nursing classes, I write brief summaries of the main ideas from the readings and the concepts from the lectures.

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

33. When I can't understand the material in nursing classes, I ask another student in my class for help.

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

34. I try to understand the material in my nursing courses by making connections between the readings and the concepts from the lectures.

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

35. I attend class regularly.

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

36. Even when course materials are dull and uninteresting, I manage to keep working until I finish.

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

37. I try to identify students in my nursing classes whom I can ask for help if necessary.

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

38. When studying for nursing classes I try to determine which concepts I don't understand well.

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

39. I often find that I don't spent very much time on nursing coursework because of other activities.

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

40. When I study for nursing classes, I set goals for myself in order to direct my activities in each study period.

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

41. If I get confused taking notes in classes, I make sure I sort it out afterwards.

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

42. I rarely find time to review my notes or readings before an exam.

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

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

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

44. I make sure I keep up with the weekly readings and assignments for my nursing courses.

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

45. I make lists of important terms from my nursing courses and memorize the lists.

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

Please answer the following questions:

Age:

Gender:  Female  Male

Present GPA in all nursing courses:

How many hours do you spend studying independently per week?

How many hours do you work per week in employment outside of school?

Type of baccalaureate nursing program in which you are enrolled (Check one)

Traditional or 4 year baccalaureate degree

Accelerated baccalaureate degree

End of Survey.

Thank you for your participation.



APPENDIX B  
RECRUITMENT E-MAIL

## RECRUITMENT E-MAIL

Subject: Research Proposal

Director of Dean of Nursing Program,

I am a doctoral candidate at the Indiana University School of Nursing in Indianapolis. I am interested in conducting a national survey of students enrolled in accelerated and traditional baccalaureate programs for my dissertation research. The proposed study will explore and compare the use of self regulatory learning strategies used by these two groups of students. I have attached an abstract of the proposed research to this e-mail. My pilot research on this topic was published as a major research article in the September, 2007, issue of *The Journal of Nursing Education*.

I was wondering if you would allow me to survey your students during their last semester of study. I have received approval for this exempt study from the IUPUI/Clarian Institutional Review Board. My dissertation chair, Dr. Diane Billings, is named as principal investigator.

I would sincerely appreciate an opportunity to speak with you about this project so that you will be able to make an informed decision concerning your school's participation. Would there be a convenient time for me to speak with you? I would be available to converse with you \_\_\_\_\_.

I look forward to speaking with you,

Sincerely,

Patricia Mullen PhDc, RN, CNE

APPENDIX C  
DESIGNEE LETTER

## DESIGNEE LETTER

Faculty Survey Distributor,

Thank you for your assistance in distributing the informed consents and surveys to your students. Please accept this \$10 gift card for your assistance in completing this research project. I especially appreciate your willingness to distribute these surveys during a class period.

It is preferable to distribute the informed consent forms and surveys to your students at the beginning of a class period or immediately when they return to class from a break. It has been my experience that when students are given the informed consent and survey at the beginning of a class period, less time is actually taken from the class itself. Students have read the consent and answered survey questions in less than 15 minutes after distribution at the beginning of a class period or directly after a break. Informed consents and surveys should be distributed at the same time to all students.

Prior to distributing the informed consents and surveys, read this script to the students:

“You have been selected to participate in this study because you are in the final stages of your traditional or accelerated nursing program. Your participation in this survey will help faculty learn about strategies students use to learn with the intention of using this information to improve the ways that faculty can help their students learn. Please read the consent form prior to completing the survey. Participation in this study is voluntary. If you choose to participate, you will answer 45 survey questions and 6 demographic questions. All who participate should keep the informed consent sheet in case they have any questions about the research after completing the survey.

All surveys should be returned to the envelope provided by the researcher located in the front of the classroom. The envelope will be sealed when all surveys have been returned to the envelope. Faculty members who distribute the surveys will not have access to survey responses. The surveys will be sent directly to the researcher after all surveys are returned.”

Students should then be provided with time to read the informed consent and complete the survey questions. I have included sealable envelopes in which to place surveys in individual classrooms. A large prepaid envelope should be used to return mail surveys to the researcher after all students have completed them. Only survey

forms should be returned to the researcher. When all surveys have been returned, please seal the envelope immediately and return mail it directly to the researcher.

Thanks again for your assistance in this project.

Sincerely,

Patricia Mullen

APPENDIX D  
INFORMED CONSENT

IUPUI and CLARIAN INFORMED CONSENT STATEMENT  
FOR

Comparison of Students Enrolled in  
Traditional and Accelerated  
Baccalaureate Degree Nursing Programs  
Use of Academic Self Regulatory Learning Strategies

You are invited to participate in a research study of cognitive and environmental resource management learning strategy use, which has been linked to student academic success. You were selected as a possible subject because you are enrolled in a traditional and an accelerated baccalaureate nursing program in a public or private university or college. Please read this form and ask any questions you may have before agreeing to be in the study.

The study is being conducted by Patricia Mullen, a nursing doctoral student at Indiana University School of Nursing at Indiana University Purdue University Indianapolis.

STUDY PURPOSE

The purpose of this study is to gather data which will be used to identify and assess differences in self regulatory learning strategy use between students enrolled in traditional and accelerated baccalaureate nursing programs.

NUMBER OF PEOPLE TAKING PART IN THE STUDY

If you agree to participate, you will be one of a possible 400 subjects who will be participating in this national research study.

PROCEDURES FOR THE STUDY

If you choose to participate, use a No. 2 pencil or ball point pen to record your responses to the survey questions by placing an X on the line at the place that best describes the learning behaviors that you have used and presently use in your nursing courses. Completion of the survey should take 15 – 20 minutes. You may write short answers to complete demographic information as needed.

## RISKS OF TAKING PART IN THE STUDY

There is a slight possibility that you may be uncomfortable answering some of the survey questions. There are no risks anticipated as a result of participation in this study. Course grades will not be affected by participation in the study.

## BENEFITS OF TAKING PART IN THE STUDY

There is no direct benefit from participation in this research study.

## ALTERNATIVES TO TAKING PART IN THE STUDY

Because participation in this study is voluntary, you may choose to not participate. If so, return the unmarked surveys to the individual who distributed it.

## CONFIDENTIALITY

Efforts will be made to keep your information confidential. Your responses will be compiled and results will be tabulated in summary form. All data sources will be stored securely in a locked file cabinet. Raw data sources will be destroyed following data analysis.

Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the study investigator and his/her research associates, the IUPUI/Clarian Institutional Review Board or its designees, study sponsor, and (as allowed by law) state or federal agencies (specifically the Office for Human Research Protections (OHRP)).

## COSTS

There are no costs associated with participation in the study.

## PAYMENT

You will not receive payment for taking part in this study.



## CONTACTS FOR QUESTIONS OR PROBLEMS

For questions about the study, contact the researcher, Patricia Mullen at 303-964-5142 or Diane Billings 317- 852-7124. If you cannot reach the researcher during regular business hours (i.e., 8:00 a.m. - 5:00 p.m.), please call the IUPUI/Clarian Research Compliance Administration office at 317/278-3458 or 800/696-2949.

For questions about your rights as a research participant or to discuss problems, complaints or concerns about a research study, or to obtain information, or offer input, contact the IUPUI/Clarian Research Compliance Administration office at 317/278-3458 or 800/696-2949.

## VOLUNTARY NATURE OF STUDY

Taking part in this study is voluntary. Your decision whether or not to participate in this study will not affect your current course grade or grades in any courses undertaken in your baccalaureate nursing program.

Thank you for your cooperation.

APPENDIX E  
SCATTER PLOT OF SAMPLE AGE

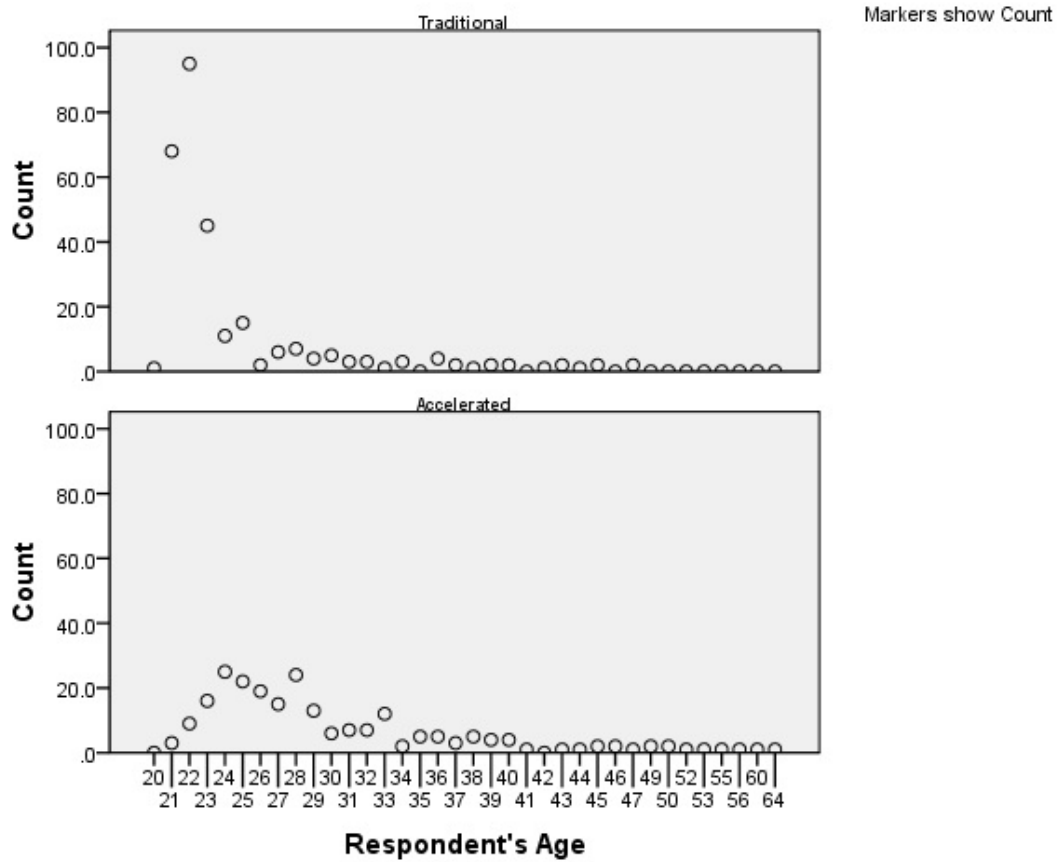


Figure 2. Scatter plot of sample age.

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# CURRICULUM VITAE

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Major: Nursing Science

MSN, University of Northern Colorado, Greeley, CO (2000)  
Major: Nursing. Minor: Teaching  
Completion of theory and clinical coursework required to apply for licensure as a Clinical Nurse Specialist (CNS) in Chronic Illness

B.S., Metropolitan State College of Denver, Denver, CO (1998)  
Major: Nursing

Diploma, St. Francis Hospital School of Nursing, Evanston, IL (1970)  
Major: Nursing

## **Professional Experience**

Regis University, Denver Colorado  
Assistant Professor, 2001 - Present

Affiliate Faculty Member (Spring/Summer, 2001)  
Instructor, Loretto Heights Department of Nursing (August 2001 - 2005)  
Assistant Professor (2006 - present)

Theory & Skills Lab Instructor and Clinical Coordinator for Nursing Foundations and Adult Health I & II (Medical Surgical Nursing): Seminars II, III, & IV; Professional Seminar II. Clinical Co-ordinator and Seminar Facilitator for Senior Practicum in Accelerated and RN-BSN options. Experience teaching in all undergraduate baccalaureate options (Accelerated, Traditional, and RN-BSN, online & on campus).

- Adult Health/Therapeutics Content Team Leader (2003 - 2004)
- Program Co-Facilitator of the Regis University Mentoring Program (2003 - 2005)
- Quality Evaluation Committee, Loretto Heights Department of Nursing (2001 - present)
- Medical Surgical Nursing Task Force (2003 - 2005)
- Faculty Institute Task Force (2004 - present)
- Academic Mentor & Advisor RN-BSN Option (2001-2003)

- Academic Mentor & Advisor, Traditional Option (Fall 2002 - Summer 2003)
- Academic Mentor and Advisor, Accelerated Option (Spring - Fall, 2003 - Spring, 2004)

University Hospital, Denver, CO  
Staff Nurse MICU (1996 - 2008)

Responsible for provision of nursing care for critically ill adult patients.

- Intermittent preceptor responsibilities for new staff nurses

Community College of Denver, Denver, CO  
Tutor (1994 - 2003)

Tutor for first and second year nursing students in Basic Nursing Concepts, Fundamentals of Nursing (Nursing Skills) Medical Surgical Nursing I & II, Physical Assessment, Psychiatric Nursing, Obstetrical Nursing, & Test Taking Skills.

Community College of Denver, Denver, CO  
Laboratory Supervisor & Co-Instructor, Basic Nursing Skills; Clinical Instructor; Clinical Coordinator (1995 - 1999)

Responsible for set-up and preparation of nursing skills laboratory and co-instruction of basic nursing skills to first year nursing students (Fall semester 1996 - 1997).

- Medical Surgical Clinical Instruction, first and second year nursing students (1995 - 1999)
- Clinical Coordinator, Medical Surgical Nursing (Fall, 1999)

Denver Veterans Administration Medical Center, Denver CO  
Staff Nurse MICU-CCU (1977 - 1994)

Responsible for the provision of nursing care for critically ill veteran patients.

- Instructor, Critical Care Course (1987 - 1993): Medications Utilized in the Critical Care Setting, Nutritional Needs of Critically Ill Clients, Neuroendocrine Diseases in Critical Care
- Intermittent charge nurse and preceptor responsibilities



Republic RSB, Naperville, IL  
Case Manager (1988 - 1992)

Responsible for phone and on-site case management of adult and pediatric clients with complex chronic and/or acute illnesses.

Denver Visiting Nurses Association, Denver, CO  
Extended Care, Pediatrics (1989 - 1996)

Provided nursing care for chronically ill pediatric home care patients requiring ventilator support.

Fort Miley Veterans Administration Medical Center, San Francisco, CA  
Staff Nurse, RICU-MICU-CCU (1975 - 1977)

Responsible for the provision of nursing care to critically ill adult veteran patients.

- Intermittent charge nurse and preceptor responsibilities

Hines Veterans Administration Medical Center, Hines, IL  
Staff Nurse, Cardiology & CCU (1973 - 1975)

Responsible for the provision of nursing care to critically ill and chronically ill adult veteran patients.

- Intermittent charge nurse and preceptor responsibilities

MacNeal Memorial Hospital, Berwyn, IL  
Staff Nurse, ICU (1970 - 1973)

Responsible for the provision of nursing care to critically ill medical, surgical, and cardiac adult and pediatric patients.

- Intermittent charge nurse responsibilities

### **Publications**

Mullen, P. A. (2007). Use of self regulating learning strategies by students in the second and third trimesters of an accelerated baccalaureate nursing program. *Journal of Nursing Education*, 46(9), 406-412.

Mullen, P. A. (2003). Adult care nursing: Disorders in fluid and electrolyte balance & digestive disorders. In C. B. Rosdahl & M. T. Kowalski (Eds.), *Textbook of basic nursing* (8<sup>th</sup> ed., pp. 1164-1174, 1419-1461). Philadelphia: Lippincott, Williams & Wilkins.

Mullen, P. A. (2000). *A comparison of teaching strategies to promote critical thinking as an outcome of learning in the undergraduate nursing classroom*. Unpublished master's Thesis. University of Northern Colorado, Greeley.

### **Presentations**

Mullen, P. A. (2006, April). *Motivation and self regulating learning strategy use of students in second and third trimesters of an accelerated BSN program*. Poster session presented at the first annual Conference on Accelerated Nursing Programs, Philadelphia.

Mullen, P. A. (2000, April). *A tale of two strategies: The effects of cooperative teaching strategies on critical thinking of undergraduate nursing students*. Poster session presentation at the 33<sup>rd</sup> annual Communicating Nursing Research Conference, Western Institute of Nursing, Denver, CO.

### **Honors and Awards**

William and Doris Rodie Dissertation Scholarship, Indiana University, Purdue University Indianapolis, Indianapolis, IN (March 2008)

Outstanding Thesis Award, University of Northern Colorado, Greeley, CO (2000)

Nightingale Foundation Scholarship, Colorado Nurses Foundation, Denver, CO (2000)

Friends of Nursing Scholarship, Friends of Nursing, Denver, CO (2000)

Magna Cum Laude, Metropolitan State College of Denver, Denver, CO (1998)

Part Time Instructor of the Year, Community College of Denver, Department of Health and Human Services, Denver, CO (1996 - 1997)