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The Intervention of Active Learning Strategies to Increase Nursing Student Self-Directed Learning

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The Intervention of Active Learning Strategies on a Nursing Student's Level of Self-Directed Learning

Executive Summary

Problem

Undergraduate nursing students at a Midwestern community college struggled to understand and retain content presented in long lecture format courses. The Population, Intervention, Comparison, and Outcomes (PICO) for the program are as follows: P—Nursing students at a Midwestern community college in terms 1, 2, 4, and 5 of the LPN and ADN program; I—Use of guided practice as an active learning teaching strategy in the lab setting to enhance nursing student self-directed learning readiness in terms 1 and 4; C— Nursing students in term 2 and term 5 at a Midwestern community college who did not have a lab course that used guided practice; O— Increased student results on a self-directed learning readiness post-test questionnaire compared to the pre-test results. The PICO question was: "In Midwestern community college nursing students enrolled in current lab courses, does using guided practice as an active learning strategy during lab, develop better self-directed learning skills?"

Purpose

The purpose of the project was to determine if active learning strategies impacted nursing students by increasing the student's level of self-directed learning.

Goals and Objectives

Goals included increased self-directed learning scores, student engagement, lower attrition rates, increased NCLEX pass rates, and increased course grades. The objectives of this project were to determine if active learning strategies, specifically the use of guided practice in the lab setting, increased a nursing student's self-directed learning, and to determine what demographic factors affected a nursing student's self-directed learning.

Plan

A quantitative pretest and posttest design was implemented. Students received an emailed link with the self-rating scale of self-directed learning questionnaire pretest at the start of the semester and were given the same questionnaire as the posttest at the end of the semester. Students formed four different groups and two of the groups received the guided practice active learning intervention in a lab course. The data from each participant's pretest and posttest scores were coded and analyzed using an independent t-test to compare means. Descriptive statistics were also collected for demographic variables and were coded for frequency counts.

Outcomes and Results

Of the students enrolled in the spring semester of the nursing program, 47 students completed the pre-test and 59 completed the post-test SRSSDL tool. The results of this study were inconclusive that the use of guided practice as an active learning strategy alone increases a nursing student's level of self-directed learning in one semester of nursing school. Guided practice may have been one of several contributors amongst other active learning strategies and inherent individual student characteristics and growth that caused all four terms of students to have higher self-directed learning scores on the SRSSDL tool at the end of the semester than at the beginning of the semester. The p-value for comparing the overall pre-test and post-test of all terms combined was .027 showing statistically significant results for a difference in the pre-test and post-test for all terms but was not significant when comparing the intervention and control groups. The Pearson's coefficient for the project was 0.9983 and Cronbach's alpha for the overall project was 0.8672. Students report that they appreciate the use of active learning strategies rather than strictly lectures, and other research supports the use of active learning strategies to encourage student engagement and learning. Students should also be encouraged to take the SRSSDL to allow them to see where they fall on the scale. They should then be encouraged to determine what inherent demographic factors help them to be self-directed learners and then to use those qualities and the

SRSSDL tool to continue to increase their levels of SDL while in nursing school and during their careers as they continue to be lifelong learners.

Acknowledgements

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Learning

Problem Recognition and Definition

Based on several anecdotal conversations with students, nursing students at a

Midwestern community college struggled to understand and retain information needed to

succeed on critical-thinking exercises and exams. Students were accustomed to being taught in a

lecture format during their prerequisite courses. Nursing courses, though, tended to be two to

four hours in length, and informal student feedback indicated that they struggled to pay attention

for three to four hours, and did not feel a connection with the course content when it was

presented in lecture format. In addition, students were not used to the time-consuming nature of

nursing courses and the amount of work required outside of class to be successful in the

program. Therefore, students struggled to apply course content on application-focused test

questions found on the nursing exams that prepared students to take the National Certification

Licensure Examination (NCLEX). Due to the intense nature of nursing school, along with

students trying to balance school, work, and life, there is a 30% attrition rate among nursing

students at a Midwestern community college, varying slightly by semester (K. Ericson, personal

communication, October 3, 2014).

Statement of Project Purpose

The purpose of this project was to determine if the use of a guided-practice active

learning strategy in the nursing lab setting would increase nursing students' ability to be self-

directed learners as they progressed through the nursing program. A secondary result of this

study was to determine what demographic factors inherently affected the self-directed learning (SDL) of the typical nursing student.

Problem Statement and PICO Question

The PICO statement (P, population; I, intervention; C, comparison; O, outcome) developed to address the problem in nursing education at a Midwestern community college was as follows:

P—Nursing students at a Midwestern community college in terms one, two, four, and five of the licensed practical nurse and associates degree in nursing programs.

I—Use of guided practice as an active learning teaching strategy in the lab setting to enhance nursing student SDL readiness in terms one and four. These students attend nursing theory courses, clinicals, and lab courses using guided practice.

C— Nursing students in term two and term five at a Midwestern community college who did not have a current lab course that used guided practice. These students attend nursing theory courses and clinicals.

O— Increased student results on a SDL readiness post-test questionnaire compared to the pre-test results. Higher results or degree of change from surveyed Midwestern community college nursing students in terms one and four was expected.

The goal of the study was to answer the question: In Midwestern community college nursing students enrolled in current lab courses, does using guided practice as an active learning strategy during lab develop better SDL skills?

Project Significance and Scope

The scope of this capstone project involved a descriptive and quasi-experimental study using a pre-test and post-test design that asked nursing students at a Midwestern community college to rate their SDL on a scale using the Self-Rating Scale of Self-Directed Learning (SRSSDL) tool (Williamson, 2007). The pre-test was given at the beginning of the semester, and the post-test was given at the end of the semester. The interventional groups were nursing students in terms one and four who were enrolled in a lab course that used guided practice, an active learning strategy. The two control groups were nursing students in terms two and five who were not enrolled in a lab course. The significance of the results would impact how nursing is taught at a Midwestern community college in upcoming semesters. This outcome was student sensitive, teacher sensitive, and organizational sensitive, as it impacts the learning needs of the student, the format a nursing instructor uses to teach information, and it will probably impact a change in teaching methods across the nursing program at a Midwestern community college (Kane & Radosevich, 2011).

Nursing Theory

Hildegard Peplau (1997) developed the Theory of Interpersonal Relations. Peplau's theory focuses on the nurse-patient relationship, but several of the theory's principles can be applied to the nursing student-student relationship as well. This theory discusses how humans have a need for connectedness. Peplau (1997) discusses how patients have a need for connectedness due to increased levels of stress due to health concerns. Nursing students also have increased levels of stress due to the complex nature of nursing school. Nursing students can feel connected to each other as they support one another throughout the stressful years of

nursing school. "People need relationships with other persons. At their best, relationships confirm self-worth, provide a sense of connectedness with others, and support self-esteem. Relationships constitute the social fabric of life" (Peplau, 1997, p. 166). Peplau's (1997) theory discusses three phases: the orientation phase, the working phase, and the termination phase. Nursing students also go through these three phases as they interact throughout the nursing program from meeting each other in their first course to graduating and going their separate ways. This theory applies to active learning strategies in that it encourages human connectedness and interpersonal relations as students work together to form conclusions and devise solutions to nursing problems.

Education Theory

David Kolb is a researcher known for the promotion of experiential learning theory. Experiential learning theory is defined as "the process whereby knowledge is created through the transformation of experience" (Kolb & Kolb, 2005, p. 194). There are six main assumptions to support this theory:

1. "Learning is best conceived as a process, not in terms of outcomes.
2. All learning is relearning.
3. Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world.
4. Learning is a holistic process of adaptation to the world.
5. Learning results from synergetic transactions between the person and the environment.
6. Learning is the process of creating knowledge" (Kolb & Kolb, 2005, p. 194).

According to Kolb & Kolb (2005), learning is a lifelong process that takes a person's personal experiences and reframes them into learning opportunities that affect the person holistically. This theory supports the use of building on the learner's prior experience with the subject matter and giving the learner new experiences to offer more exposure to the subject matter. Kolb & Kolb (2005) encourage the use of a productive learning environment and giving learners the time for conversational learning, acting, reflecting, feeling, and thinking. Lastly, Kolb & Kolb (2005) encourage the use of strategies that allow learners to take responsibility for their own learning. This helps learners develop their SDL skills as they are given opportunities to work together to help each other learn in an active learning environment.

The nursing major lends itself well to experiential learning theory due to the fact that over half of the learning experiences occur in the lab or clinical setting. Providing care for patients in a lab, simulation, or clinical setting allows students to experience classroom topics in a real-life, hands-on situation. Kolb & Kolb's (2005) theory can be used to support the use of active learning strategies by using the lab setting for students to work together to assist each other in developing nursing skills. Students can discuss with their peers in the lab environment their feelings, thoughts, actions, and priorities for the mannequin or patient scenario as they are practicing their skills. This allows students to reflect on their experiences and think deeply about the course subject matter as it relates to their lab-simulated patient (Kolb & Kolb, 2005; Lisko & O'Dell, 2010).

Foundational Theory

Malcolm Knowles first defined andragogy as "the art and science of helping adult learners" (Knowles, 1988, p. 43). Andragogy focuses on the ways adults learn best. Andragogy

uses teaching approaches that allow adult learners to be collaborative and solve problems rather than being lectured to in a classroom. Also, andragogy encourages equality between a teacher and learner. The teacher is viewed as a facilitator of learning rather than the head of the classroom (Queensland Occupational Therapy Fieldwork Collaborative (QOTFC), 2007).

Knowles's adult learning theory has four main assumptions.

These assumptions are that as individuals mature:

1) Their self-concept moves from one of being a dependent personality toward being a self-directed human being;

2) They accumulate a growing reservoir of experience that becomes an increasingly rich resource for learning;

3) Their readiness to learn becomes oriented increasingly to developmental tasks of their social roles; and

4) Their time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly, their orientation toward learning shifts from one of subject-centeredness to one of performance-centeredness (Knowles, 1988, p. 44-45).

Knowles identifies six principles to the adult learning theory. Knowles notes that "adults are internally motivated and self-directed; adults bring life experiences and knowledge to learning experiences; adults are goal oriented; adults are relevancy oriented; adults are practical; adult learners like to be respected" (QOTFC, 2007, para. 3).

Knowles (1988) goes on to clarify an adult learner's readiness to learn by stating that "people become ready to learn something when they experience a need to learn it in order to cope more satisfyingly with real-life tasks or problems" (p. 44). Adult learners enrolled in nursing school may have an increased readiness to learn due to the task of being successful in the nursing program and the desire to assume the role of being a nurse. A nursing educator needs to create a learning environment that fosters the learner's readiness to learn and centers around what the student "needs to know" that directly applies to his or her life goals (Knowles, 1988).

In regard to implications of practice for Knowles's readiness to learn assumption, he recommends that teachers focus the timing of their teaching concepts on what the adult learner most wants to learn at that time. In other words, take advantage of teachable moments. Second, Knowles recommends grouping the adult learners into homogeneous or heterogeneous groups, depending on what the subject matter involves. If the group is based on a distinct developmental task, then homogeneous groups might be better. If the group is based on a variety of tasks, then heterogeneous groups would allow students to have flexibility and meet others with similar interests (Knowles, 1988).

Review of Evidence

Nursing students at a Midwestern community college struggled to understand and retain information needed to succeed on critical-thinking exercises and exams. Students also struggled to apply course content on application-focused test questions found on the nursing exams. Due to the intense nature of nursing school, along with students trying to balance school, work, and life, there is a 30% attrition rate among nursing students at a Midwestern community college, varying slightly by semester (K. Ericson, personal communication, October 3, 2014).

Systematic Review of the Literature

A literature review was conducted using the EBSCO Host database and using the keywords of "nursing education," "active learning strategies," "self-directed learning," "student motivation," "evaluation tools," "peer group learning," and "skill acquisition." Results were found from multiple databases, including Academic Search Premier, Cumulative Index for Nursing and Allied Health Literature (CINAHL), PsycINFO, and Medline. Articles included Level II through Level VII of evidence as based on Houser and Oman's (2011) Seven Tiered Levels of Evidence Table (p. 141). These levels consist of evidence obtained from one well-designed randomized control trial, quasi-experimental designs, non-experimental studies, systematic reviews of the literature, a single description study, and expert opinion. Articles were used if they directly related to the search terms listed above. Searches had to be filtered, as most resulted in an abundance of articles. Articles were excluded if they focused on nursing practice instead of nursing education, were in a foreign language, were more than ten years old, involved only online or distance education, were not published in peer-reviewed journals, only involved simulation, or were too narrowly focused and not generalizable. Articles were prioritized on whether or not they directly involved nursing education. (See Appendix A).

Active learning. Greenwood (2011) defines active learning as "The process of having students engage in some activity that forces them to reflect upon ideas and how they are using those ideas. Requiring students to regularly assess their own degree of understanding and skill at handling concepts or problems in a particular discipline. The attainment of knowledge by participating or contributing. The process of keeping students mentally, and often physically, active in their learning through activities that involve them in gathering information, thinking

and problem solving." This collective definition encompasses a more descriptive and specific definition of active learning strategies that was used as the basis for this project.

Research encourages a shift in teaching styles from a "sage on the stage" lecture style to a "guide on the side" active learning model. There is currently a shift from teaching to learning in today's educational institutions, with a new focus on active learning strategies, student engagement, promoting critical thinking, and encouraging SDL. Using active learning strategies allows students to participate in the learning process and helps them to develop into lifelong self-directed learners. (Chunta & Katrancha, 2010; Clark et al., 2008; Clayton, 2006; Fisher, King, & Tague, 2001; Gabr & Mohamed, 2011; Peter, 2005; Phillips & Vinten, 2010; Popkess and McDaniel, 2011).

One of the main articles used for this project paper was by Popkess and McDaniel (2011). Their research was a descriptive correlational design with a sample of 3,000 college students in three difference majors and used results from a 2003 survey of college student engagement. The results showed that nursing students were less engaged than their education and other health career majors peers. According to Popkess & McDaniel (2011), using active learning strategies in a nursing classroom encourages students to be actively involved in learning the information, resulting in better student outcomes and knowledge retention. At present, research shows nursing students feel that they are less engaged in active and collaborative learning strategies than other majors (Popkess and McDaniel, 2011). With active learning strategies, learning is placed in the hands of the students. The goal is for the students to be engaged in the learning as they partake in activities covering the content. A second article by Clark (2008) conducted research on two groups of nursing students to test if student engagement and communication

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skills increased after using team-based learning as an active learning strategy. The results

supported increased student engagement and communication skills for the students attending the

team-based learning nursing course. Clark et al. (2008) encourages faculty to move away from

traditional lectures, which place the responsibility for learning on the instructor dispersing the

information. Instead, faculty should act as facilitators, creating a group learning environment in

which students are engaged and encouraged to work together to obtain new knowledge.

The use of active learning strategies has been shown to increase student engagement,

increase student retention of material, increase critical-thinking skills, increase problem-solving

skills, encourage team work and learning from one another, and encourage personal reflection

(Chunta & Katrancha, 2010; Clark et al., 2008; Clayton, 2006; Fisher, King, & Tague, 2001;

Gabr & Mohamed, 2011; Peter, 2005; Phillips & Vinten, 2010; Popkess and McDaniel, 2011).

Self-directed learning. Active learning strategies can lead students to be more self-

directed learners as they progress through the nursing program and enter the nursing profession.

Malcolm Knowles is credited with defining SDL (Knowles, 1975). Knowles (1975) states that

SDL is "a process in which individuals take the initiative, with or without the help of others, in

diagnosing their learning needs, formulating learning goals, identifying human and material

resources for learning, choosing and implementing appropriate learning strategies and evaluating

learning outcomes" (p. 18). SDL is an instructional method that is popular in adult education

and allows the learner to accept responsibility for his or her own learning. SDL involves a

process where the learner determines what they need to know, takes the initiative for learning

that material, and evaluates if learning was achieved without the assistance of an instructor

(Knowles et al., 2008). "The degree of control the learner is willing to take over their own

learning will depend on their attitude, abilities, and personality characteristics" (Fisher, King, &

Tague, 2001, p. 516). Each learner has a personal readiness level for SDL. SDL is important in nursing education due to the amount of study time that is required outside of the classroom for most students to be successful. In addition, practice with SDL prepares nursing students to become lifelong learners as they enter the nursing profession and continue to seek out evidence-based practice (Cadorin, et al., 2012; Fisher, King, & Tague, 2001).

Nurses need to stay up to date on advances in health care treatments and best practices. Nurses need to seek out current information based on evidence-based practice to provide the most up-to-date care for their patients. "Healthcare professionals work in a complex system where constantly changing social and technological aspects represent a serious challenge. These advances require many competencies, which need to be frequently refreshed" (Cadorin, et al., 2012, p. 153).

Three original SDL scales have been developed. Guglielmino (1977) developed the Self-Directed Learning Readiness Scale. Oddi et al. (1990) developed the Oddi Continuing Learning Inventory. Fisher and King have re-validated the tool developed by Guglielmino (1977) and reduced it to forty items (Fisher & King, 2010; Fisher et al., 2001). In 2007, Williamson created the SRSSDL. Based on Williamson's (2007) scale, an Italian version was created and validated that further supported Williamson's scale (Cadorin, Bortoluzzi, & Palese, 2013).

Studies have revealed several benefits of using SDL in nursing education. SDL has been shown to increase the motivation, autonomy, and confidence of nursing students; help strengthen learning skills; help develop interpersonal communication skills; and to affect nursing students throughout their lives (Avdal, 2013; Gagnon et al., 2013; Hewitt-Taylor, 2001; Levett-Jones, 2005; & O'Shea, 2003; Timmins, 2008). Avdal (2013) found that high levels of SDL are linked

with high student achievement levels. Timmins (2008) and Levett-Jones (2005) both focus on how important it is for nursing faculty to encourage and develop SDL skills in students.

Guided practice. Guided practice involves students helping each other practice a lab skill for the first time by each student assuming a role to assist in the learning process. Guided practice has been used at a Midwestern community college for years. Guided practice has been used in lab courses to encourage nursing students to help one another during the learning of a new skill. Students are expected to be actively engaged in the learning process. Students are divided into groups of four. Students assume three roles during guided practice. The Demonstrator performs the skill while being guided or assisted by the Evaluator. The Evaluator guides the Demonstrator as they perform the skill using the skill checklist as a guide. The remaining two students are both Observers who observe the Demonstrator and Evaluator while following the skill checklist. Observers have the opportunity to ask questions of the Demonstrator, Evaluator, or instructor at the end of each rotation. They double check that the Evaluator has encouraged the Demonstrator to perform the skill correctly. Students rotate throughout every role until every student has assumed each role. Students take turns in the rotation order throughout the semester (M. Bethards, personal communication, October 6, 2014).

With each rotation, the ability of the Demonstrator to independently perform the skill correctly increases. During the first rotation, the Demonstrator and Evaluator work together as a team, providing the Demonstrator with as much help as necessary. The Observers may assist as well. During the second rotation, the Evaluator may help the Demonstrator only if needed. The Observers are attentive and give direction if the Demonstrator and Evaluator miss something. During the third rotation, the Evaluator may help the Demonstrator only if they make a mistake, and then the Evaluator and Observers will stop the Demonstrator and correct the mistake.

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During the fourth rotation, the Demonstrator gets no assistance with the skill. The skill should be done as if in the client's room. The Evaluator and Observers make notes and provide feedback after the skill is completed. The Demonstrator is not stopped if a mistake is made (M. Bethards, personal communication, October 6, 2014). Students are also encouraged to practice the skill as often as needed during open lab times, with peers or on their own. The instructor's role is to be present in the room. The instructor will not demonstrate the skill and will intervene only if an error goes unrecognized by peers (M. Bethards, personal communication, October 6, 2014).

The use of collaboration between nursing student peers for guided practice is supported in the literature. The literature supports that students enjoy the process and that peer assessment facilitates student engagement and motivation and encourages more professional accountability amongst students (Casey et al., 2011; Clark et al., 2008; Cushing et al., 2011; Goldsmith, Stewart, & Ferguson 2006; Grierson et al., 2012; Stables, 2012).

Project Plan and Evaluation

Market Analyses

A market analysis consists of outlining the details of the nursing education industry.

Need and Industry description and outlook. The Bureau of Labor Statistics (2015) says that the job outlook for registered nurses is expected to increase by 19% through the year 2022. This translates to an increase of 526,800 jobs. The job outlook is increasing faster than the average for all other occupations because of an increased emphasis on preventative care,

increasing rates of chronic health conditions, and the demand for health care for the aging Baby Boomer population.

The entry-level education required to be a nurse is an associate's degree in nursing, and the median pay in 2012 was $31.48 per hour or $65,470 per year. There is no required on-the-job training or work experience in a related occupation. The number of registered nurses employed in the United States in 2012 was 2,711,500 (Bureau of Labor Statistics, 2015). Colleges of nursing will be called on to educate more nurses in order to fit this growing need.

Nursing education is in the growth stage of its product lifecycle due to the rapidly growing need for nursing educators and registered nurses. The main customer groups within nursing education are colleges and universities that offer nursing as a major (Fortenberry, 2010).

Target market and Resources. Community colleges appeal to local residents who want an affordable education. Specifically, the Midwestern community college markets to students seeking a two-year degree, students seeking college preparatory classes, and non-traditional students seeking a career change. The Midwestern community college nursing program offers an associate of nursing degree that is quicker to obtain than a bachelor's degree in nursing and is also more affordable. The Midwestern community college fills the need of a quality education at an affordable cost per credit hour.

Defining the customer. The customer of this capstone project was the typical nursing student. For the purpose of this discussion, typical nursing students would be considered female and between the ages of 20 and 44.

Sustainability and Wants and needs of the customer. The typical nursing student wants to become a nurse to be able to care for patients and make a solid income to support them

in the future. Nursing is a reliable and rewarding career that attracts a lot of caring students. Nursing students also would love to have less stress during school, and they want to be successful in the program and on the NCLEX so they can accomplish their goal of becoming a nurse. Nursing students desire that nursing education be straight-forward, manageable, and to prepare them well for practice (Popkess & McDaniel, 2011).

Sustainability and Cyclical trends. Cyclical trends in the nursing student population could involve younger nursing students in their late teens or early twenties being less ready for SDL and active learning strategies due to a lack of real-life experience. Also, non-traditional or older nursing students may be uncomfortable with active learning strategies, as they might be used to more traditional lectures from previous schooling experiences.

Feasibility. The project was very easy to implement at a Midwestern Community College where guided practice was already being used and the nursing program was interested in switching to more active learning strategies in a new concept-based curriculum. The project was not cost prohibitive and could easily be replicated at another nursing college. The project was achievable in one semester and the data collection process for study participants was easy to access and involved a minimal time commitment.

Risks. The risks associated with this project for study participants are minimal. There could be fear of punishment if they did not participate but this was addressed in the emailed informational sheet. The SRSSDL tool also took a minimal time commitment so the risks were limited and none of the questions posed an obvious threat to the participants. All demographic questions were optional to decrease any threats and ensure anonymity. The risks to the project in

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general included inconclusive results, lack of students willing to participate to cause a small sample size, and multiple extraneous variables that could affect the project outcome.

Unintended consequences. Any detrimental unintended consequences were minimal. If anything, students recognized more about their level of SDL as they completed the SRSSDL which would be a positive outcome. Students might have even recognized growth or a change in learning attitude because of the pre and post-test questionnaire.

SWOT Analysis

Strengths. The strengths of the project centered on the benefits that the results will bring to the Midwestern community college nursing program after sustainability. If students can increase their readiness for SDL through the use of guided practice and other active learning strategies, then students will be better prepared to be successful in the nursing program. Also, developing skills to be self-directed learners will continue to help nursing students as they progress in their careers and become lifelong learners. In addition, demographic characteristics were also considered and compared in study results. This project provided information on demographic considerations that could influence a student's SDL (Avdal, 2013; Gagnon et al., 2013; Hewitt-Taylor, 2001; Knowles, 1975; Levett-Jones, 2005; & O'Shea, 2003; Timmins, 2008).

Weaknesses. The weaknesses of the project included several extraneous, moderator, and antecedent variables. The extraneous variable is "sometimes referred to as a confounding variable because it may interfere with or obscure the relationships between the independent and dependent variables" (Christenbery, 2011, p. 252). Extraneous variables for the capstone project included lack of student motivation to study outside of class time, students being distracted

during lab guided practice due to life circumstances, students missing labs due to illness, students' level of preparation for lab and class, students responding in a certain way to please the instructor, broken equipment to implement planned active learning strategies of guided practice, variability in the knowledge level of the students between the four terms, and a difference in teaching methods of guided practice and active learning strategies (Giddens et al., 2012; Lisko & O'Dell, 2010). Most of the above variables would have had a negative impact or no impact on the proposed outcome. These extraneous variables were managed by recognizing all uncontrollable variables as limitations in the study report.

The moderator variable is defined as "a variable that influences or moderates the relationship between the independent and dependent variables" (Christenbery, 2011, p. 252). Moderator variables for the capstone project included a student who does not participate in guided practice, a student's age, a student's gender, a student's individual learning style, a student's attitude toward the instructor, a student's academic level, a student's preparation for lab and class, and a student's acceptance of the use of guided practice in lab (Chunta & Katrancha, 2010; Clark et al., 2008; Clayton, 2006; Fisher, King, & Tague, 2001; Gabr & Mohamed, 2011; Peter, 2005; Phillips & Vinten, 2010; Popkess and McDaniel, 2011). Most of the above moderator variables would have had a negative impact on achieving the outcome, except for student age, student gender, and student learning styles, which could have had a positive or negative impact, or no relationship at all.

The antecedent variable is defined as "a variable that occurs before the independent and dependent variables and therefore can have an influence on the dependent variable" (Christenbery, 2011, p. 252). Antecedent variables for the capstone project included students'

motivation to learn the content, students' interest in the lab and class topics, students' previous experience with lectures and active learning activities, and the instructor's comfort with using an active learning style teaching approach (Chunta & Katrancha, 2010; Clark et al., 2008; Clayton, 2006; Fisher, King, & Tague, 2001; Gabr & Mohamed, 2011; Peter, 2005; Phillips & Vinten, 2010; Popkess and McDaniel, 2011). All of the above antecedent variables would have had either a positive or negative effect on the intervention depending on the previous feelings or thoughts of the student and instructor.

A ranking in SDL scales is based on many demographic characteristics that affected the results of this study in addition to the active learning strategy of guided practice. A student's gender, age, achievement level, learning type, and internal motivation level, along with other possible variables, impacted the rating each student gave for the SDL scale. A weakness of this study was that the number of students responding to the questionnaire was small—47 student participants for the pre-test and 59 student participants for the post-test. Also, the study involved four terms of nursing students but took place during only one semester of nursing school, so the study does not show longevity, effects on the NCLEX pass rates, effects on student attrition rates, or student personal growth. Another weakness of this project is that not all previous research has supported links between SDL and learner attributes or demographics. Results of previous studies vary widely. Another weakness is that the active learning strategy that was used as the intervention in this project is the use of guided practice in the lab setting. This did not exclude the use of other types of active learning strategies used in theory courses throughout the Midwestern community college nursing program in terms one, two, four, and five.

Opportunities. The opportunities for this project were to influence the teaching style within the nursing program at a Midwestern community college toward a focus on the use of active learning strategies, with the specific use of guided practice. In addition, a Midwestern community college is switching to a concept-based curriculum in the fall of 2015. The results of this project will help support the continued use of guided practice in lab courses. The use of active learning strategies is encouraged in a concept-based curriculum (Giddens et al., 2012).

Threats. The threats of this project were results that did not support the capstone project or show no statistically significant difference. Threats also included several of the extraneous, moderator, and antecedent variables listed above, including students not willing to participate in the project, students not taking the pre-test and post-test seriously, and possible cost of replication of the study. Several antecedent, moderator, and extraneous variables could also alter the results of this study. In addition, a lab course is inherently hands-on, while a theory course is didactic in nature, which was a limitation of this study (Chunta & Katrancha, 2010; Clark et al., 2008; Clayton, 2006; Fisher, King, & Tague, 2001; Gabr & Mohamed, 2011; Peter, 2005; Phillips & Vinten, 2010; Popkess and McDaniel, 2011).

Forces

The driving force for this capstone project involved the current push toward the use of active learning strategies in education and involved students in the learning process, especially for adult learners. The use of active learning strategies has been shown to increase student engagement, increase student satisfaction, increase student retention, increase critical-thinking skills, increase problem-solving skills, encourage team work and learning from each other, and encourage personal reflection (Chunta & Katrancha, 2010; Clark et al., 2008; Clayton, 2006;

Fisher, King, & Tague, 2001; Gabr & Mohamed, 2011; Peter, 2005; Phillips & Vinten, 2010; Popkess and McDaniel, 2011).

Restraining forces were as follows: faculty comfort level with active learning strategies, student motivation to learn the content and participate in guided practice, students' previous experience with lectures and active learning activities, students' preparation for labs and class, and students' willingness and motivation to be self-directed learners. An additional restraining force is the increased amount of time it takes to conduct active learning strategies as opposed to lecturing. Also, it is more difficult to use active learning strategies with larger class sizes due to the complexity of working with a large group of people at the same time. Last, in a lab setting, the student-to-faculty ratio is smaller and averages eight students to one instructor. In the typical theory classroom, the ratio is twenty-four or more students to one instructor (Clark et al., 2008; Fisher, King, & Tague, 2001; Peter, 2005; Phillips & Vinten, 2010; Popkess and McDaniel, 2011).

A sustaining force of this capstone project is the benefit of using active learning strategies to increase student retention and engagement in nursing courses (Knowles, 1988; & Popkess and McDaniel, 2011). If students are self-directed learners who seek out ways to learn the content in active learning situations in the classroom environment and in a format that works for their learning needs outside of class, then they will hopefully reap the benefits by succeeding on nursing exams and successful completion of their associate of nursing degree (ADN). If this study could be continued in later years, it would be beneficial to study how the use of guided-practice and active learning strategies in the new concept-based nursing curriculum at a Midwestern community college impact students' SDL as they advance in their careers. Another

sustaining force is the fact that this Midwestern community college is switching to a concept-based curriculum in the fall of 2015, and this type of curriculum encourages the use of active learning strategies (Giddens et al., 2012).

Stakeholders

The main stakeholders of this study were the nursing students. Typical nursing students would be considered to be female and between the ages of 20 and 44. One campus of a Midwestern community college has several nursing students who are male, aged 18-19, and some who are greater than 45 years of age, but these are outliers to the typical nursing student population. There are several nursing students who are single parents, and most are also trying to work part-time, if not full-time, to meet financial obligations. Most students currently work in the healthcare field. Several nursing students have pursued other majors before switching to nursing. All of the nursing students at a Midwestern community college have taken certified nurse's aide (CNA) coursework, but they vary in their work experience as CNAs. All nursing students try to balance a family life, social life, work, and school, sometimes leading to stressful situations (N. Thilges, personal communication, February 21, 2014).

Nursing students are usually juggling multiple life responsibilities. Besides the demands of a hectic school and clinical schedule, they may be single parents, have a low income, first-generation college students, in the process of a divorce, in an abusive relationship, or working full time. Between all of these possible life responsibilities, attending classroom theory courses and working up to 16 hours of clinical per week can make the typical nursing student vulnerable during the time she or he is in school (Jimenez, Navia-Osorio, & Vacas Diaz, 2010; Pulido-Martos, et al., 2011).

Additional stakeholders would be the nursing faculty at a Midwestern community college using the active learning strategies, the Midwestern community college nursing program if NCLEX rates were to improve as a result of future studies, and future employers who would benefit from a nursing graduate's strong desire to seek out resources while being a lifelong learner.

Project Team

The project team included the investigator, the Capstone advisor at Regis University, Dr. Colleen McCallum, the project mentor, and a project consultant that had experience with past research and had studied the benefits of guided practice in 2007.

Cost and Benefit Analysis

The researcher plans used an institution-purchased survey tool called Qualtrics, to administer an electronic version of the SRSSDL which was free to use. Additional costs would be faculty time of approximately 200 hours at a cost of $50.00 an hour, totaling $10,000.00. A Regis University faculty member was available to help analyze the data for no additional costs.

Nursing education in the midwest has been shown to cost an average of $27,000-$28,000 per year for the top-rated colleges. Students who are able to pass the nursing program would be able to benefit by earning a nursing salary of $40,000 a year and up. Students who are unable to pass the nursing program or the NCLEX exam would have thousands of dollars' worth of student loans and would be unable to find a job as a registered nurse to assist in paying off those loans (U.S. News and World Report, 2014).

The benefit would be statistics to show the advantage of the use of active learning strategies in a nursing classroom, specifically the use of guided practice in the lab setting. Future benefits might include higher student engagement, higher student motivation to study and be prepared for class and lab, increased self-esteem for nursing students, higher grades for nursing students, a lower attrition rate for nursing students, a higher NCLEX pass rate for a Midwestern community college, and a strong hiring rate of nursing graduates by area employers. This would allow students the benefit mentioned above of earning a nurse's salary and obtaining a degree after paying for an education.

Timeframe for Capstone Project

The project was presented to Doctorate of Nursing Practice faculty at Regis University for approval in the fall of 2014. Regis University Institutional Review Board approval was obtained in January 2015. The project was implemented at a Midwestern community college during the spring 2015 academic semester. The pre-test SRSSDL was administered during the first seven weeks of classes in January 2015. The post-test SRSSDL was administered during the last four weeks of the semester in April and May. Throughout the spring 2015 academic semester, the lab courses implemented the use of guided practice as students learned new nursing skills in terms 1 and 4. The data was analyzed in July and August 2015. Results of the study will be disseminated in August or September of 2015.

Budget and Required Resources

The cost of replicating this study would depend on if the researcher was a faculty member at the institution. If not, the researcher would have to rent the use of a classroom, which can vary in cost from approximately $50.00-$300.00 for an auditorium. The researcher might

have to use survey software which could cost $100.00 or pay for paper and copies of a hard copy questionnaire scale for $10.00. A statistician may need to be hired for $200.00. A statistical program may need to be purchased to run statistics on the results for $100-200.00. The required resources include an academic institution supportive of the project, assistance from faculty at the institution, and willingness of students to participate in the study. Resources at the institution would be a classroom with computers for each student for an online survey and access to students throughout the semester to implement the intervention.

The researcher involved in this study conducted the intervention part of this research as part of her normal faculty job duties. The classrooms were already in use by each term of students as regularly scheduled. An online survey tool was used that the college had access to as an annual subscription.

Nursing education in the Midwest has been shown to cost an average of $27,000-$28,000 per year for the top-rated colleges. Students who are able to pass the nursing program would be able to benefit by making a nursing salary. Students who are unable to pass the nursing program or the NCLEX exam would have thousands of dollars' worth of loans and would be unable to find a job as a nurse to assist in paying off school loans (U.S. News and World Report, 2014). Faculty salaries range from $40,000-$100,000 across the Midwest and would be in important consideration in the replication of this study at another college.

Mission and Vision Statements

The mission statement for this project was to provide statistical evidence that active learning strategies, specifically the use of guided practice in the lab setting, increased a nursing student's SDL to assist the student to be successful in the nursing program and continuing on to

be a lifelong learner. The vision statement for this project was that nursing students' success in a Midwestern community college nursing program would improve due to the use of active learning strategies throughout the program to achieve a higher level of SDL.

Project Goals

Short-term goals for this project included higher student engagement, higher student motivation to study and be prepared for class and lab, higher grades for nursing students, and a lower attrition rate for nursing students.

Long-term goals for this project included increased motivation to be life-long learners, faculty acceptance and support of using active-learning strategies instead of lecture in nursing courses, and a higher NCLEX pass rate for a Midwestern community college.

Project Processes and Outcomes

A pre-test questionnaire of the SRSSDL was offered to nursing students at one campus of a Midwestern community college in terms one, two, four, and five (there was no term three at this Midwestern community college; it is the summer term of support courses) during the first seven weeks of the Spring 2015 school semester. Students in terms one and four were involved in lab courses using guided practice in addition to theory courses and clinicals throughout the semester. Students in terms two and five attended theory courses and clinicals. During the last four weeks of the end of the semester, all nursing students were given the same questionnaire as a post-test. As the semester concluded and during the summer of 2015, the results were analyzed and links were found between the intervention and demographic data and SDL levels. A final report of the project and its findings was available in August of 2015 (Williamson, 2007).

The students in each term were different students. A student can only be in one term at a time so four different groups of students were involved in this study in the form of four groups of aggregate data. The students were sent an email to the entire cohort of students in each term. The email provided an informational sheet to each student about participation in this study. (See Appendix B). The student received a link to the online SRSSDL tool. In addition to the 60 question tool, the student was asked to provide voluntary and optional answers to demographic questions: gender, age, typical course grades, and work experience. These answers were optional to help ensure a participant's consent to questions that may decrease the anonymity of certain questions due to decreased numbers of students in that demographic category. A demographic disclaimer was included to alert students that the demographic questions were optional. The survey was done via an email link to ensure it was done outside of class time. While this decreased the number of participants, it ensured anonymity for those who chose not to participate in the study without any repercussions from faculty or classmates. Making the survey optional outside of class time also eliminated any concerns of having a captive audience and students feeling forced to the survey due to peer pressure in the classroom setting. This helped increase the reliability and validity of the results. The completion of the tool and demographic data took approximately 10 minutes or less of time.

Study participants did not have access to their pre-test SRRSDL scores so that this information did not affect their actions throughout the semester and decrease the validity of the study. In addition, the pre-test scores and post-test scores of each individual student were not compared. The data was only looked at as aggregate data between each term or cohort of students.

In order to not have to randomize the student sample, the two control group cohorts of students in terms two and five were offered the guided practice intervention during open lab time in two hour increments throughout the semester to guarantee that they had equal access to the intervention.

The outcome of this project was similar to the goals and was to show that the use of guided practice in the lab setting as an active learning strategy assisted students in becoming better self-directed learners. Another outcome of this project was to show how demographic factors affect a student's SDL. The outcome for each study participant consisted of five broad categories that are evaluated for SDL on the SRSSDL. These five categories are awareness, learning strategies, learning activities, evaluation, and interpersonal skills. From the results of the 12 questions that fall under each of these categories, the subjects were given a total score for SDL that was used to evaluate their level of self-directedness in learning (Williamson, 2007).

In the tool created by Williamson (2007), each of the five broad areas is defined. Awareness: Twelve items relating to the learners' understanding of the factors contributing to becoming self-directed learners. Learning strategies: Twelve items explaining the various strategies self-directed learners should adopt in order to become self-directed in their learning processes. Learning activities: Twelve items specifying the requisite learning activities learners should actively engage in in order to become self-directed in their learning processes. Evaluation: Twelve items revealing learners' specific attributes in order to help monitor their learning activities. Interpersonal skills: Twelve items relating to learners' skills in interpersonal relationships, which are pre-requisite to their becoming self-directed learners (Williamson, 2007, p. 70-71).

Williamson (2007) also divides the scoring of the 60-question tool into a range of

categories for the level of self-directedness of the learner. A low level of learner self-

directedness is a range of 60-140. Williamson (2007) describes this level as "Guidance is

definitely needed from the teacher. Any specific changes necessary for improvement must be

identified and a possible complete re-structuring of the methods of learning" (p. 83). A moderate

level of learner self-directedness is a range of 141-220. Williamson (2007) describes this level

as "This is half way to becoming a self-directed learner. Areas for improvement must be

identified, evaluated and a strategy adopted with teacher guidance when necessary" (p. 83). A

high level of learner self-directedness is a range of 221-300. Williamson (2007) describes this

level as "This indicates effective SDL. The goal now is to maintain progress by identifying

strengths and methods for consolidation of the students' effective SDL" (p. 83). (See Appendix

C).

Logic Model

Conceptual models are diagrams used to show causal linkages and relationships between

a series of variables or concepts. "A conceptual model provides a visual picture that represents

the research question which is to be investigated. The best models convey complex information

in a way that is not only parsimonious but also permits a quick grasp of complicated

relationships" (Donatti, Wild, Hareendran, 2008). The logic model used for this capstone project

explains the relationship between the inputs, activities, outputs, outcomes, and impacts of using

active learning strategies. (See Appendix D).

Problem = Students can not apply and do not retain information presented in traditional

lecture format. Inputs = Nursing students and faculty at a Midwestern Community College;

access to guided practice and active learning strategies. Activities = Implementation of an active learning strategy using guided practice in the nursing lab setting. Outputs = Positive student feedback about the use of active learning strategies and increased scores on the post-test SRSSDL tool. Outcomes = Students will feel engaged in their learning and be able to apply, retrain, and grow from the knowledge obtained through this activity and increased scores on SRSSDL tool. Impact = College will switch to using active learning strategies with new curriculum.

Methodology

This project is an evidence-based practice (EBP) project in which a quality improvement plan, program evaluation, or simple educational or standard of care intervention will be completed. In most cases, a simple pre-test and post-test evaluation will assess the effect of the intervention. The project will be internal to an agency and will inform the agency of issues regarding health care quality, cost, and patient satisfaction. The results of this project are not meant to generate new knowledge or be generalizable across settings but rather seek to address a specific population, at a specific time, in a specific agency. These projects translate and apply the science of nursing to the greater health care field.

Projects utilize the acronym "PICO", rather than stating a formal research hypothesis. The acronym stands for: Population or Disease (P), Intervention or Issue of Interest (I), Comparison group or Current Practice (C), and Outcome (O) and is usually framed as a question (Melnyk and Fineout-Overholt, 2011, p. 31).

The question this study seeks to address is: In Midwestern community college nursing students enrolled in current lab courses, does using guided practice as an active learning strategy during lab develop better SDL skills?

The scope of the capstone project involved a descriptive and quasi-experimental study using a pre-test and post-test design asking nursing students at a Midwestern community college to rate their SDL on a scale. The pre-test was given at the beginning of the semester, and the post-test was given at the end of the semester. The two control groups were nursing students in terms two and five who were not currently enrolled in a lab course using the intervention of guided practice. The significance of the results will impact how nursing is taught at a Midwestern community college. If students show an increase in their SDL, then a shift to the use of more active learning strategies and guided practice will be encouraged in all nursing courses. This outcome is student sensitive, teacher sensitive, and organizational sensitive, as it impacts the learning needs of the student, the format a nursing instructor uses to teach information, and it will probably impact a change in teaching methods across the nursing program at a Midwestern community college (Kane & Radosevich, 2011).

The pre-test questionnaire of the SRSSDL was offered to nursing students at one campus of a Midwestern community college in terms one, two, four, and five (there is no term three at this Midwestern community college; it is the summer term of support courses) within the first six weeks of the Spring 2015 school semester. Students in terms one and four were involved in lab courses using guided practice in addition to theory courses and clinicals throughout the semester. Students in terms two and five attended theory courses and clinicals only. During the last four weeks of the end of the semester, all nursing students were given the same questionnaire as a post-test. As the semester concluded and during the summer of 2015, the results were analyzed

to search for links and statistically significant differences amongst the data. A final report of the project and its findings was available in August of 2015 (Williamson, 2007).

Population and Sampling parameters. The subjects involved in this study were a nonrandom convenience sample of all current nursing students enrolled on one campus of a Midwestern community college. The students in each term are different students. A student could only be in one term at a time so four different groups of students were involved in this study in the form of four groups of aggregate data. The students were sent an email to the entire cohort of students in each term. The email provided an informational sheet to each student about participation in this study. (See Appendix B). The student also received a link to the online SRSSDL tool. In addition to the 60 question tool, the student was asked to provide voluntary and optional answers to demographic questions: gender, age, typical course grades, and work experience. These answers were optional to help ensure a participant's consent to questions that may decrease the anonymity of certain questions due to decreased numbers of students in that demographic category. A demographic disclaimer was included to alert students that the demographic questions were optional. The survey was sent via an email link to ensure it was completed outside of class time. While this may have decreased the number of participants, it ensured anonymity for those who chose not to participate in the study without any repercussions from faculty or classmates. Making the survey optional outside of class time also eliminated any concerns of having a captive audience and students feeling forced to complete the survey due to peer pressure in the classroom setting. This helped increase the reliability and validity of the results. The completion of the tool and demographic data for study participants take approximately less than 10 minutes of time.

Study participants did not have access to their pre-test SRSSDL scores so that this information would not affect their actions throughout the semester and decrease the validity of the study. In addition, the pre-test scores and post-test scores of each individual student will not be compared. The data will only be looked at as aggregate data between each term or cohort of students.

In order to not have to randomize the student sample, the two control group cohorts of students in terms two and five were offered the guided practice intervention during open lab time throughout the semester to guarantee that they had equal access to the intervention (Polit, 2009).

Description of population and sample. "The population is everyone or everything that meets the criteria for inclusion" (Zaccagnini & White, 2014, p. 78). According to this definition, the population could be any student. The criteria for inclusion in this project involved any nursing student currently enrolled in the nursing program at one campus of a Midwestern community college. If all four terms were full then the maximum population for this project would have been 96 students but some semesters were not full due to student attrition.

"The sample is a subset of the population and the process for how the subset will be selected" (Zaccagnini & White, 2014, p. 78). The ideal sample size for inclusion in this project was 24 students in each nursing course or 96 students total. For the pre-test, 47 students filled out a portion of the SRSDDL with 42 fully completed surveys. Five participants did not complete all 60 questions. For the post-test, 59 students filled out the SRSSDL but only 56 students completed the entire survey. Incomplete surveys were discarded and not used in data analyses.

Power analysis. In a previous study conducted by Cardorin et al., (2012), it was determined that the mean SRSSDL from a sample of 847 nurses, nursing students, respiratory therapists, and respiratory therapy students was 224.7 with a standard deviation of 25.0. The expected mean for the sample in the study would be 221 or the minimum or the high level for self-directedness according to Williamson's (2007) tool. The alpha was set at 0.05 and the power of the test was set at 0.80. Power level—0.8 is widely accepted to show an 80% chance of finding a statistical difference (Zint, n.d.). A t-test was used to evaluate the data. The ideal sample size for this level of power would be 64 students (Statistical Solutions, LLC, 2014). This study only had 42 pre-test participants and 56 post-test participants, so a 0.8 power level was not achieved for this effect size.

In order to protect the nursing student study participants, the responsibility to the students as an investigator was to be straightforward about the purpose of the study, what the results of the study were going to be used for, and to be clear that participation in the questionnaire would in no way affect a class grade. The questionnaires were anonymous and computer-generated. They included no identifying information.

Choice of instrument. The tool used in this study was chosen because it was a Likert scale that is easy to understand, quick to complete, and resulted in quantitative data. Kane and Radosevich (2011) state that "a closed response format questionnaire relies on the standardization of measurement whereby all respondents are presented with the same questions and are constrained to respond in a uniform manner. They allow a sample of the population to be studied and the findings to be generalized to an entire population" (p. 168). Dr. Patsy Cullen (2011) states that the benefits of using questionnaires are that they are flexible, cost effective,

allow for subject anonymity, allow for pre-determined questions, and can generate a large

amount of data. The cons to using a questionnaire for research are superficial information

results, results limited by subject recall, and subjects feeling pressured to respond in a certain

way (Cullen, 2011).

There are some inherent methodological issues when using a questionnaire. First,

selection bias can be a problem due to low response rates. This issue remained a problem for

this study. The email link to participate in this study was emailed out to all cohorts of students

three times over the course of two weeks to encourage participation both at the beginning and

end of the semester (Kane & Radosevich, 2011). Still, less than 60 students completed the

questionnaire at either time.

Acquiescence response bias is when questionnaire respondents reply positively or

negatively to questions simply because of the way the question is worded, regardless of their

own opinion. Acquiescence bias was managed by using the SRSSDL, which included a five-

point Likert scale and neutral wording (Kane & Radosevich, 2011).

Lastly, sociopsychologic artifacts can lead to respondents answering in a way that they

perceive to be socially desirable and free from fear of retribution instead of sharing their own

opinions. This bias was managed by using anonymous questionnaires rather than personal

interviews. Subjects were guaranteed that their answers would remain confidential and there is

no way to link data participant number with a participant name (Kane & Radosevich, 2011).

Reliability and validity. Kane and Radosevich (2011) and Cullen (2011) list threats to

internal validity as fishing and error rate problems, subject selection, maturation of subjects, and

the handling of missing data. All students were given equal opportunity to participate in the study to avoid fishing and error rate problems. The questionnaire was administered within one semester of school so maturation of subjects was not an issue. Missing data is an inherent problem with using questionnaires because questions are easily missed or skipped. If missing data is spread evenly throughout the questionnaire and study participants, then it would not introduce a systematic bias (Kane & Radosevich, 2011, p. 309). Depending on the percentage of missing data, a participant might need to be excused from the study.

Kane and Radosevich (2011) and Cullen (2011) list threats to external validity as novelty effects, experimenter effect, using the wrong questionnaire tool, and the need for findings to be generalizable to other settings. Administering this questionnaire at the end of a class period could result in a novelty effect where students just want to leave for the day and do not spend much time or thought on the answers so it was administered by email outside of class time. The questionnaire tool, SRSSDL, was easy to understand, had a clear rating system, and was not overwhelming, having 60 questions.

In regard to reliability, the main threats are lack of internal consistency reliability of multi-item scales, test-retest reliability, and interobserver reliability (Kane & Radosevich, 2011). Permission to use the SRSSDL tool was obtained via email consent from the original author. (See Appendix H). The main goal to maximize reliability was to find a tool to use that had been proven to be valid and reliable. The Delphi technique, a technique using a blind panel of experts to give feedback on the topic, was used to develop the SRSSDL tool. Consensus from the panel was achieved by the second round on 60 question items at an 80-85% amongst panel members. The SRSSDL was found to be valid and reliable (Williamson, 2007). The tool was used in a study by Cadorin et al. (2012) giving more details to the validity and reliability data. The

SRSSDL tool has been shown to have a high test-retest reliability (Pearson's coefficient = 0.73) and a high internal consistency (Cronbach's alpha = 0.94). The responses for each item were rated using a five-point Likert scale (5 = always, 4 = often, 3 = sometimes, 2 = seldom, 1 = never) (Cadorin et al., 2012). The SRSSDL uses 60 items categorized into five broad areas: awareness, learning strategies, learning activities, evaluation, and interpersonal skills. Each area contains 12 questions and the Cronbah's alpha overall is 0.949. The internal consistency of each area item is: awareness at 0.76, learning strategies at 0.81, learning activities at 0.79, evaluation at 0.86, and interpersonal skills at 0.85 (Cadorin et al., 2012).

Protection of human rights. This study did not involve vulnerable populations or an international study. This study was conducted at an established educational setting and involved research on the effectiveness of active learning strategies in nursing education. All students were offered an informational sheet about the study. The informational sheet presented clear information about the purpose of the study, what the results would be used for, and that participation would in no way affect a course grade. The questionnaire was emailed out electronically every time and outside of class time to ensure voluntary participation. The student's answers were linked to code and not attached to any identifying information so no student could be linked to their answers.

The study provided minimal risk to the subjects involved (Regis University, 2011). This capstone project was submitted for review to the Regis University Institutional Review Board and the Office of Institutional Effectiveness at the Midwestern community college in December of 2014. The Regis University Institutional Review Board granted this project exempt status and the Office of Institutional Effectiveness supplied a letter supporting this project. Permission

from the author, Swapna Williamson, of the SRSSDL tool was obtained via email. (See

Appendices E, F, G, H, and J).

Quantitative Study Project Design

Quantitative data is resulted and analyzed in numerical form (Polit, 2009). The research

project was a quantitative study because the research instrument used a Likert scale for all

questions. Likert scales usually range from least to most, with a number assigned to each point

along the range of options on the scale. The study participant determined the point on the range

of the scale that best described their answer to the question, and a number was assigned to each

option to quantify the participant's answers. Likert scales work well with ordinal data (Allen &

Seaman, 2007). In addition to the number ratings associated with the Likert scale, demographic

data will be analyzed using frequencies, which is also a form a quantitative data (Polit, 2009).

Level of Data

The level of data that was collected using the SRSSDL was ordinal level data. "Ordinal

measurement involves using numbers to designate ordering on an attribute. Ordinal

measurement allows researchers to classify people and to indicate their relative standing on a

dimension of interest" (Polit, 2009, p. 7). The Likert scale used in the tool for this study involves

ordinal measurements because the data is ranked on the scale but there is no set distance between

the categories on the scale (Polit, 2009). Additional levels of data were obtained through the

demographic questions (Polit, 2009).

Statistical Tests

Multiple statistical tests were tried to analyze the data on a Likert-style questionnaire, but

this was difficult because the data from the tool used was ordinal level data. In the past, ordinal

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level data from Likert scales have been treated as interval or ratio data because parametric tests are considered easier and provide more information than nonparametric tests (Allen & Seaman, 2007). The data used in this project was treated as interval level data in order to be analyzed and provide meaningful results. The analysis of variance (ANOVA) test could not be used because the dependent variable was not an interval or ratio level of data. This test stopped concluding results after question 30 of the SRSSDL tool and was deemed inconclusive. Instead, a two-tailed t-test was used for the statistical analysis of the two independent groups. A t-test measures if there is a statistical difference between the means of two groups, a control group and an experimental group. The t-test calculation is a ratio of the difference in the two groups' means divided by the variability in the groups (Kane & Radosevich, 2011; Polit, 2009; Trochim, 2006). The independent t-test was used to compare the means of the pre-test and post-test groups and then again to compare the means between the experimental terms of one and four with the control terms of two and five.

Descriptive statistical tests were needed to analyze the relationship between the demographic variables of gender, age, work experience, and typical course grades with the SRSSDL question scores. The descriptive statistics of percentages and frequencies were used to analyze the relationships between the demographic variables and SDL score based on the percentage and number of student responses for each question.

Pearson's coefficient and Cronbach's alpha was used to test for test and re-test reliability and internal consistency.

Software Package to Analyze Data

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Two software packages were used to analyze the data. The researcher purchased the Statistical Package for the Social Sciences (SPSS) Standard GradPack 23, which was used for the more advanced statistical tests, such as the independent t-test. The researcher also used Qualtrics, a data analysis survey tool that is free for faculty to use at the college where the researcher is employed. In the Qualtrics program, the data was already set up to be analyzed because this was the program that was used to send the survey to the students, and all of the data was already collected within Qualtrics. Qualtrics was used to find the frequency of responses for each term of students for each category of the tool (C. Gentry, personal communication, July 13, 2015).

Data Collection and Coding Processes

The data was collected within the survey program, Qualtrics. Qualtrics was used to input the SRSSDL (SRSSDL) tool and then a link to the tool within Qualtrics was emailed to all of the study population. The students then entered their answers into the survey via the email hyperlink. Each participant's answers were assigned a random code to ensure confidentiality of all participants. The same process was used for both the pre-test and the post-test data collection. After three reminder emails were sent to the study population, the survey was closed.

To code the demographic data, a cross-tabulation between the demographic variable and all 60 questions on the SRSSDL tool was created in Qualtrics and exported to Excel. From this table, the highest percentages for both the "always" and "often" answer columns were recorded as frequencies with whatever demographic variable had the highest percentage and that factor was given a count of 1. The frequencies were then added up for each demographic factor to determine which category had the highest percentage of "always" and "often" answers to each of

the five categories in the SRSSDL tool. This was done for both the pre-test and post-test data for comparison purposes. Each Excel document of data was then used to create a bar graph as a visual representation of the data. For the age demographic characteristic, only one participant fell in the above-40-years-old range, so this data was not used due to the potential for broken anonymity and to avoid skewing the results. For both the prerequisite course grade and the nursing course grade demographic factors, only the top grade percentage was used for the "always" category because the researcher was most interested in what grade a student received who had the highest percentage in the "always" category.

In order to conduct more sophisticated statistical tests, the data was coded into an Excel spreadsheet to be easily used within the SPSS program. An Excel document was set up with an assigned number for each participant along the vertical axis and all of the 60 SRSSDL questions along the horizontal axis, along with the questions involving the term the participant was currently enrolled in and the demographic questions. Each participant's answers were entered into every column of the two Excel documents, one for the pre-test and one for the post-test. Every piece of data was coded using numbers. The SRSSDL tool was easy to code because each option on the Likert scale tool was already assigned a number based on the participant's response. In addition, each of the demographic questions was assigned a number such as male = 1 and female = 2 to code that data within the Excel spreadsheet, as well. All of the data was then exported into the SPSS program to be analyzed.

Project Findings and Results

Bivariate Parametric Tests

Intervention and control groups. The means of each category of the SRSSDL were compared between the four terms of students (See Figures I and II) along with the overall mean score for each term on the pre-test and the post-test (See Figures III and IV) to determine if the intervention of guided practice as an active learning strategy had any effect on the group means.

Figure I. Pre-test All Terms and Average Ratings on SRSSDL Tool Categories

Pre-test All Terms and Average Ratings on SRSSDL Tool Categories
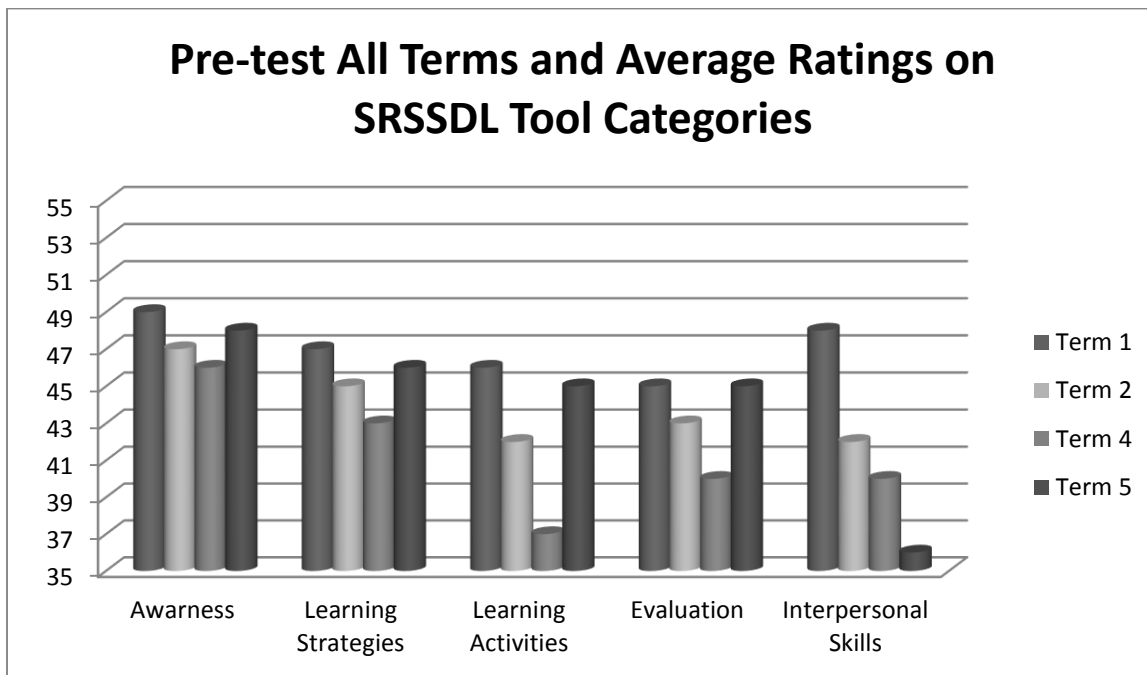
Figure II. Post-test All Terms and Average Ratings on SRSSDL Tool Categories

Post-test All Terms and Average Ratings on SRSSDL Tool Categories
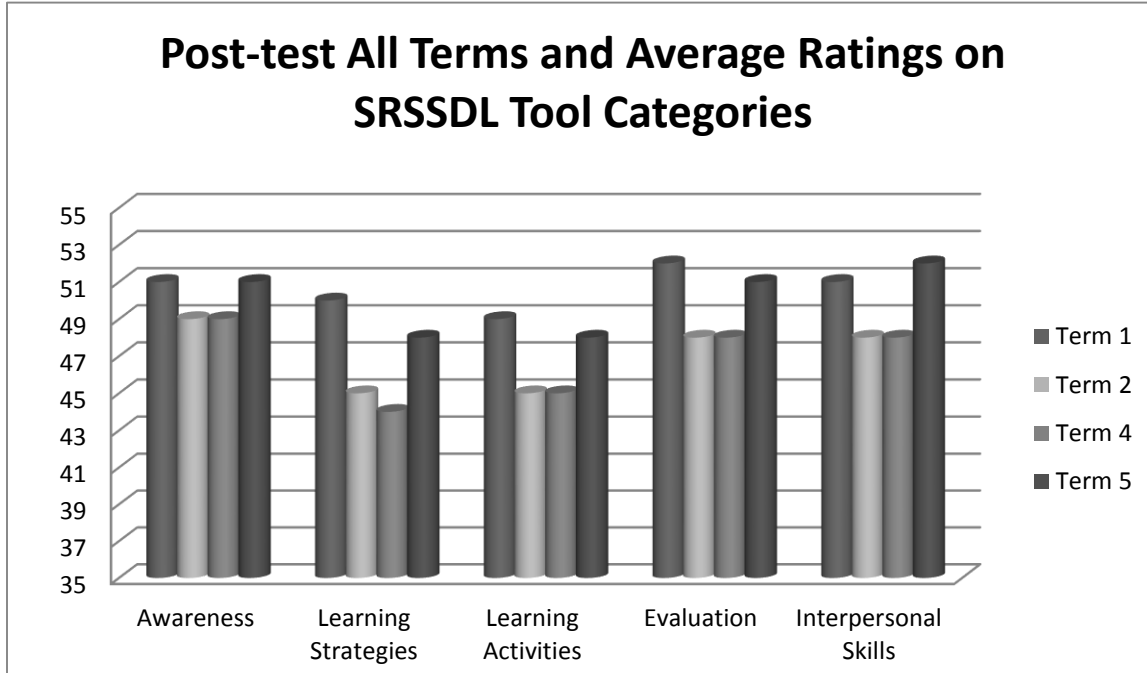
Figure III. Pre-test All Terms and Overall Average SRSSDL Tool

Pre-test All Terms and Overall Average SRSSDL Tool
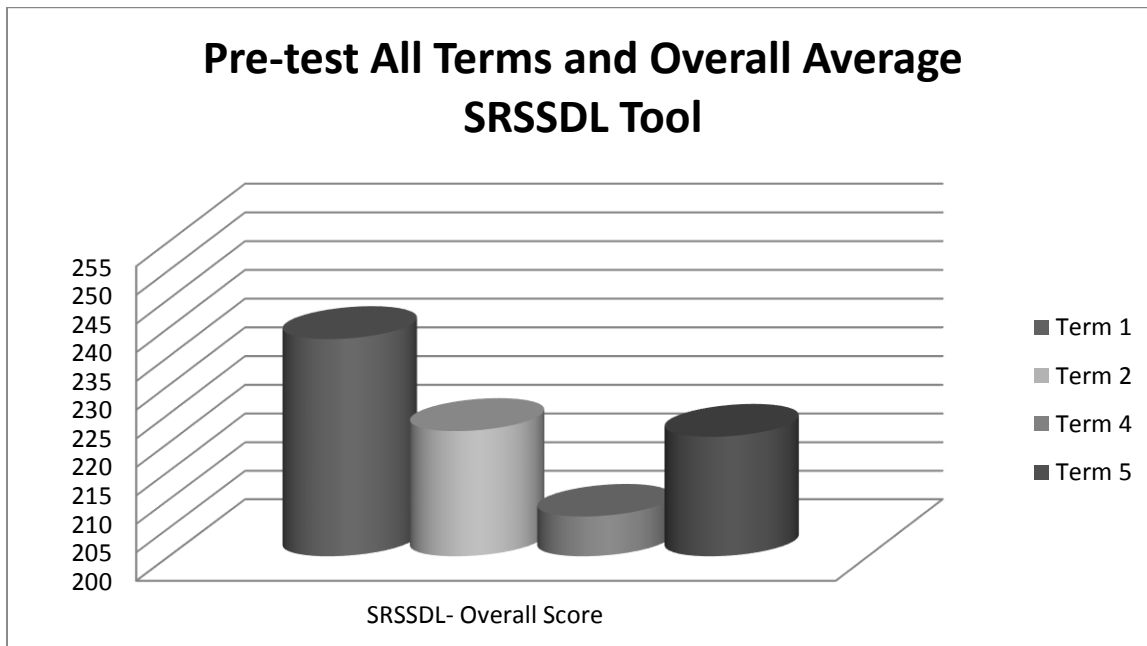
Figure IV. Post-test All Terms and Overall Average SRSSDL Tool

Post-test All Terms and Overall Average SRSSDL Tool

Overall SRSSDL Score

- Term 1
- Term 2
- Term 4
- Term 5
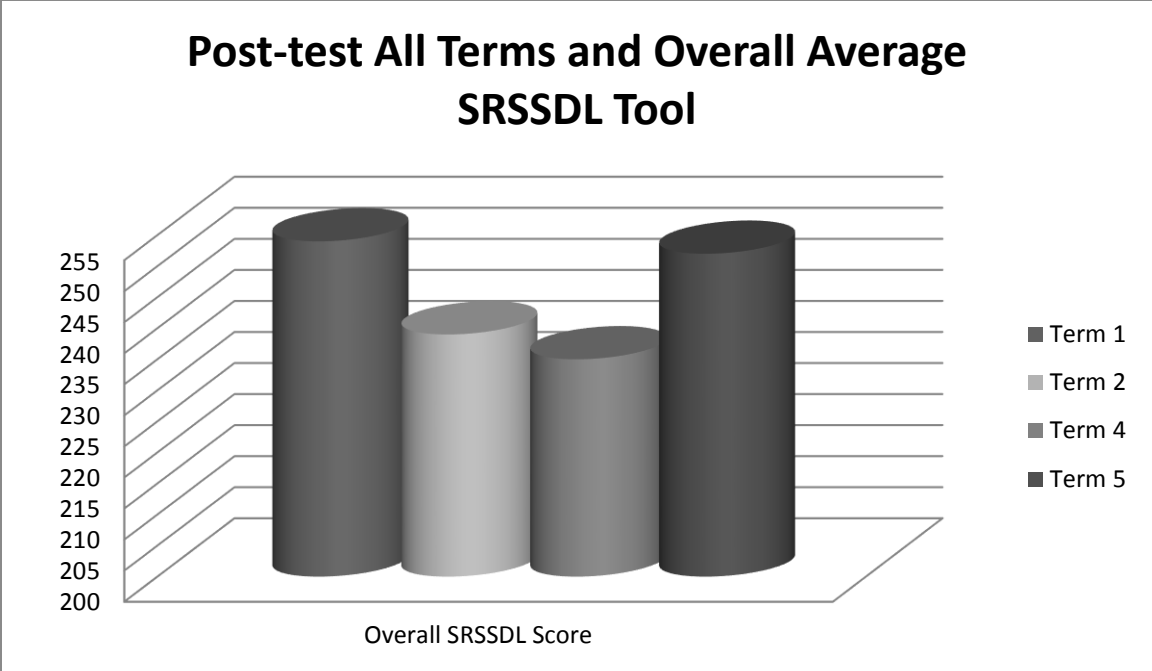
Term one had 12 participants in the pre-test and 13 participants for the post-test. Term one had the following means for the 5 categories and overall on the SRSSDL pre-test and post-test: (See Table 1)

Table 1. Average Pre-test and Post-test Scores for Term 1

Term 1		
SRSSDL Category	**Average Pre-test**	**Average Post-test**
Awareness	49	51
Learning Strategies	47	50
Learning Activities	46	49
Evaluation	45	52
Interpersonal Skills	48	51
Total Overall:	238	254

Term one showed improvement in every single category of the SRSSDL tool between the pre-test and the post-test, showing that using guided practice as an active learning strategy in the nursing lab helped increase self-directed learning in term one students.

Term two had 23 participants in the pre-test and 21 participants for the post-test. Term two had the following means for the five categories and overall on the SRSSDL pre-test and post-test: (See Table 2)

Table 2. Average Pre-test and Post-test Scores for Term 2

Term 2		
SRSSDL Category	**Average Pre-test**	**Average Post-test**
Awareness	47	49
Learning Strategies	45	45
Learning Activities	42	45
Evaluation	43	48
Interpersonal Skills	42	48
Total Overall:	222	239

Term two showed improvement or stayed the same in every single category of the SRSSDL tool between the pre-test and the post-test, showing growth as students regardless of the intervention of guided practice, which they did not receive.

Term four had 7 participants in the pre-test and 16 participants for the post-test. Term four had the following means for the 5 categories and overall on the SRSSDL pre-test and post-test: (See Table 3)

Table 3. Average Pre-test and Post-test Scores for Term 4

Term 4		
SRSSDL Category	**Average Pre-test**	**Average Post-test**
Awareness	46	49
Learning Strategies	43	44
Learning Activities	37	45
Evaluation	40	48
Interpersonal Skills	40	48
Total Overall:	207	235

Term four showed improvement in every single category of the SRSSDL tool between the pre-test and the post-test, showing that using guided practice as an active learning strategy in the nursing lab helped increase self-directed learning in term four students.

Term five had 5 participants in the pre-test and 6 participants for the post-test. Term five had the following means for the 5 categories and overall on the SRSSDL pre-test and post-test: (See Table 4)

Table 4. Average Pre-test and Post-test Scores for Term 5

Term 5		
SRSSDL Category	**Average Pre-test**	**Average Post-test**
Awareness	48	51
Learning Strategies	46	48
Learning Activities	45	48
Evaluation	45	51

Interpersonal Skills	36	52
Total Overall:	221	252

Term five showed improvement in every single category of the SRSSDL tool between the pre-test and the post-test, showing growth as students regardless of the intervention of guided practice, which they did not receive.

Statistical significance.

Table 5. Statistical Significance of Means of Pre-test and Post-test

Comparison Groups	p-value (preset alpha of .05)	t-test statistic
Pre-test and Post-test Overall	**p = .027**	**t = 2.9132**
Terms one and four compared to terms two and five	p = .5	t = 0
Awareness Pretest and Posttest	**p = .028**	**t = 2.887**
Learning Strategies Pretest and Posttest	p = .390	t= 0.926
Learning Activities Pretest and Posttest	p = .1121	t = 1.874
Evaluation Pretest and Posttest	**p = .006**	**T = 4.146**
Interpersonal Skills Pretest and Posttest	**p = .022**	**t = 3.051**

The results of the means of all terms combined overall on the pre-test compared to the post-test shows statistically significant results with a p- value = .027 (See Table 5). This shows

there is a statistically significant increase in the post-test scores over the pre-test scores and that student's SDL levels increased throughout the semester.

When comparing the means of the interventional groups one and four with the means of the control groups two and five, the p-value was greater (p = .5) than the preset .05 showing that the results were not significant. There is no statistically significant difference between the pre-test and post-test SRSSDL scores of the interventional groups and the control groups so the null hypothesis must be retained.

The individual categories of the SRSSDL tool that also showed statistical significance between the pre-test and post-test were Awareness (p = .028), Evaluation (p = .006), and Interpersonal Skills (p = .022). The other two categories of learning strategies (p = .390) and learning activities (p = .1121) did not show statistical significance meaning that there is not a significant difference between the pre-test and post-test average scores for these two categories.

Pearson's Correlation Coefficient and Cronbach's Alpha. The SRSSDL tool was used in a study by Cadorin et al. (2012) giving more details to the validity and reliability data. The SRSSDL tool has been shown to have a high test-retest reliability (Pearson's coefficient = 0.73) and a high internal consistency (Cronbach's alpha = 0.94). The SRSSDL uses 60 items categorized into five broad areas: awareness, learning strategies, learning activities, evaluation, and interpersonal skills. Each area contains 12 questions and the Cronbah's alpha overall is 0.949. The internal consistency of each area item was: awareness at 0.76, learning strategies at 0.81, learning activities at 0.79, evaluation at 0.86, and interpersonal skills at 0.85 (Cadorin et al., 2012).

When comparing Pearson's coefficient for the SRSSDL tool to the results of the capstone project data, the test/retest reliability for the pre-test and post-test scores showed a result of R = 0.9983. This is a strong positive correlation showing that the pre-test and post-test scores have a very strong correlation and a high test and retest reliability. In addition, the R-squared, coefficient of determination is 0.9966. The p-value from the Pearson coefficient is <0.00001 which is significant at $p < 0.05$ (Social Science Statistics, 2015).

The Cronbach's alpha overall for the Capstone project was 0.8672 showing a high internal consistency although not as high as the SRSSDL tool. The internal consistency of each area item was: awareness at 0.8785, learning strategies at 0.7222, learning activities at 0.2637, evaluation at 0.9074, and interpersonal skills at 0.1078 (Wessa, 2015). The awareness and evaluation categories had a higher internal consistency than the SRSSDL tool. The learning strategies category was slightly lower in internal consistency than the SRSSDL tool. The learning activities and interpersonal skills categories were much lower in internal consistency than the SRSSDL tool showing more variances in the data used for the Capstone project.

Results. The results of the means for each category of the SRSSDL and the overall score between the pre-test and post-test for each group did and did not support the research question. Terms one and four did increase in their self-directed learning scores between the pre-test and the post-test, showing that the guided practice active-learning strategy did increase the students' self-directed learning (SDL). The increase in SDL scores is not entirely due to the intervention, though, because students in the control groups of terms two and five also increased in SDL between the pre-test and post-test scores. This shows that students inherently grow and become more self-directed in their learning as time passes from the beginning of each semester to the end of each semester.

In addition, the degree of change on the pre-test compared to the post-test score on the SRSSDL tool for each term did not support the research question. Terms two and five, the control groups, had a higher degree of change between the pre-test and post-test scores than the interventional groups when comparing terms 1 and 2 and terms 4 and 5. Term five had the highest degree of change followed by term four showing that students in upper levels of nursing school become more self-directed over one semester towards the end of the program. The following table compares the average total pre-test and post-test score on the SRSSDL tool for each term of students. (See Table 6)

Table 6. Degree of Change between the Average Pre-test and Post-test Scores

Degree of Change between the Average Pre-test and Post-test Scores of the SRSSDL Tool for all Terms of Students			
	Pre-test	Post-test	Degree of Change
Term one	238	254	16
Term two	222	239	17
Term four	207	235	28
Term five	221	252	31

An interesting finding is that one would guess term five would have the highest level of SDL due to having been in nursing school the longest and being about ready to graduate. This was not the case. Term one had the highest overall score for the SRSSDL for both the pre-test

and the post-test. This could be because term one students are new to the nursing program and are basing all of their answers off of their prerequisite courses experiences rather than nursing courses like the other terms. Term five had the second highest score for the post-test, showing that they grew a lot during the semester and have a higher SDL score as they are closer to graduating. Term four had the lowest score for both the pre-test and the post-test, showing that this term had a lower SDL attitude than their peers. Anecdotal evidence showed that term four had been a weaker cohort as they progressed through the nursing program at the Midwestern community college, and this data showed that it may be because they have a lower level of SDL as a group compared to the other terms.

Reliability limitations. Limitations for this data included a large difference in the number of student respondents in each term for the pre-test and the post-test. The difference in numbers for each sample could skew the data due to natural variances in participants. In addition, as demonstrated by the results, there are other extraneous variables that affect a student's SDL and cause it to increase throughout the semester regardless of the intervention. Not all extraneous variables were able to be controlled during this study.

Descriptive Statistics

Age and SDL. As stated previously, age data was coded using the highest percentages for the "always" and "often" answers and then assigning a point to each highest age group to result in counts. For the pre-test, there were 14 participants in the 17-21 age group, 16 participants in the 22-29 age group, 11 participants in the 30-39 age group, and 1 participant in the over-40-years-old age group.   For the post-test, there were 14 participants in the 17-21 age

group, 31 participants in the 22-29 age group, 11 participants in the 30-39 age group, and 1

participant in the over-40-years-old age group. (See Table 7)

Table 7. Pre-test and Post-test Age and SRSSDL Categories Frequencies

Pre-test Age and SRSSDL Categories Frequencies

Awareness:	Age 17-21	22-29	30-39
1	1	1	
2	1		1
3		1	1
4		1	1
5		1	1
6	1		1
7		2	
8	1	1	
9	1	1	
10	1	1	
11	1		1
12	1		1
Toal:	**8**	**9**	**7**
Learning Strategies			
1		2	
2	1	1	
3	2		
4	1	1	
5	1		1
6	1		1
7		1	1
8	1		1
9	1	1	
10		1	1
11	1	1	
12	1	1	
Total:	**10**	**9**	**5**
Learning			

Post-test Age and SRSSDL Categories Frequencies

Awareness	Age 17-21	Age 21-29	Age 30-39
Awareness	1		1
2	1		1
3	1		1
4		1	1
5	1		1
6	1		1
7		1	1
8	1	1	
9	1		1
10	1		1
11	1	1	
12	1		1
Total:	**10**	**4**	**10**
Learning Strategies			2
2		1	1
3	1		1
4	1	1	
5	1		1
6	1		1
7	1	1	
8		2	
9	1	1	
10	1	1	
11	1	1	
12	1	1	
Total:	**9**	**9**	**6**
Learning Activities	2		
2	1		1

Strategies

1	1	1	
2		1	1
3		2	
4	1		1
5			2
6	1	1	
7	1		1
8	1		1
9		1	1
10		1	1
11	1	1	
12	1	1	
Total:	**7**	**9**	**8**

Evaluation

1	1		1
2	1		1
3	1		1
4	1		1
5	1	1	
6	1		1
7		1	1
8		1	1
9	1	1	
10		1	1
11	1		1
12	1		1
Total:	**9**	**5**	**10**

Interpersonal Skills

1		1	1
2	1		1
3	1	1	
4	1	1	
5		2	
6	1		1
7	1	1	
8	1	1	
9		1	1
10		1	1
11	1		1

3		2	
4		1	1
5		1	1
6		2	
7	1		1
8	1	1	
9	1		1
10	1		1
11	1	1	
12	1		1
Total:	**9**	**9**	**6**

Evaluation

		1	1
2	1	1	
3	1		1
4	1	1	
5	1		1
6	1		1
7	1		1
8	1		1
9	1		1
10	1		1
11	1		1
12	1		1
Total:	**12**	**3**	**9**

Interpersonal Skills

		1	1
2	1		1
3	1		1
4	1		1
5	1	1	
6		1	1
7	1	1	
8	1	1	
9	1		1
10	1		1
11		1	1
12	1	1	
Total:	**9**	**7**	**8**

	12	1	1	
Total:	**7**	**10**	**7**	

Figure V. Pre-test Age and SRSSDL Categories
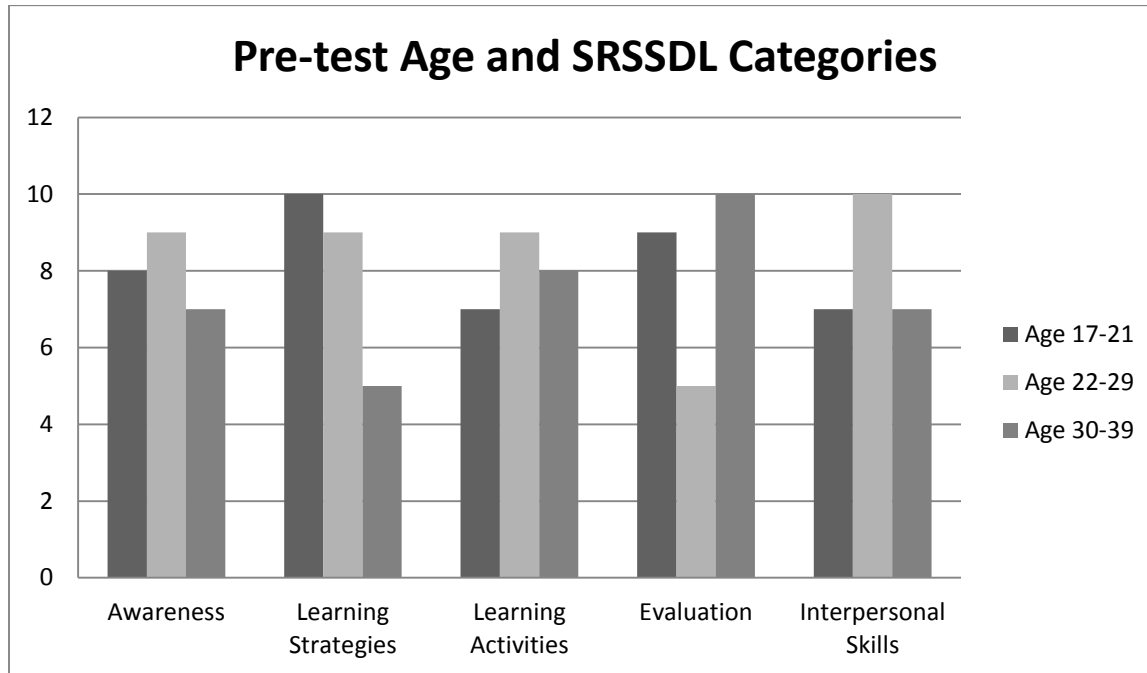
Figure VI. Post-test Age and SRSSDL Categories

Post-test Age and SRSSDL Categories
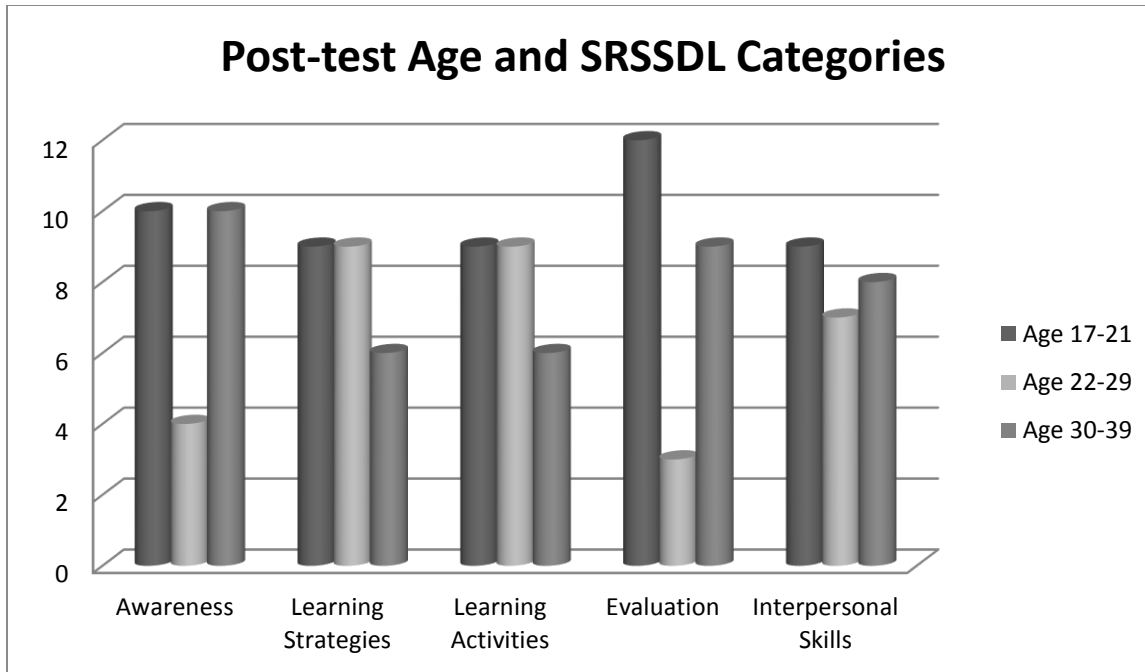
For student participants in the age range of 17-21, their pre-test and post-test scores for the SRSDDL were as follows: (See Table 8)

Table 8. 17-21 Age Group and SRSSDL Category

17-21 Age Group		
SRSSDL Category	**Pre-test Score**	**Post-test Score**
Awareness	8	10
Learning Strategies	10	9
Learning Activities	7	9
Evaluation	9	12
Interpersonal Skills	7	9

For student participants in the age range of 22-29, their pre-test and post-test scores for the SRSDDL were as follows: (See Table 9)

Table 9. 22-29 Age Group and SRSSDL Category

22-29 Age Group		
SRSSDL Category	**Pre-test Score**	**Post-test Score**
Awareness	9	14
Learning Strategies	9	9
Learning Activities	9	9
Evaluation	5	3
Interpersonal Skills	10	7

For student participants in the age range of 30-39, their pre-test and post-test scores for

the SRSDDL were as follows: (See Table 10)

Table 10. 30-39 Age Group and SRSSDL Category

30-39 Age Group		
SRSSDL Category	**Pre-test Score**	**Post-test Score**
Awareness	7	10
Learning Strategies	5	6
Learning Activities	8	6
Evaluation	10	9
Interpersonal Skills	7	8

Results. A comparison between the age groups is difficult due to a lack of themes in the

data. The older students tended to rate themselves higher in the SDL categories of interpersonal

skills and evaluation, showing that these categories are a result of maturity as well as lab

coursework. The 17-21 age group showed an increase in almost every SDL category between the pre-test and post-test, whereas the other two age groups scored themselves lower on the post-test in the evaluation and interpersonal skills categories. This could be due to the stress of the nursing program and not enjoying the evaluation process of nursing school. Overall, there are no distinct themes in the data, showing that age is not a large factor on a student's SDL score. SDL is probably based more on life experience and other demographic variables besides age.

Reliability limitations. Limitations of this data analysis were coding errors, extraneous variables that affected the results, and inherent variations in the samples. The results of this data comparison were limited by large ranges of age, whereas smaller age ranges might have yielded more precise results. In addition, as mentioned above, the over-40-years-old category was not taken into consideration for the analysis process due to having only one participant.

Prerequisite course grade and SDL. Only the highest percentage of "always" answers were taken into consideration when determining the highest frequency for a prerequisite course grade due to the researcher wanting to see a connection between the type of students who would answer "always" and a typical prerequisite course grade. For the pre-test, there were 22 participants who chose the grade of A, 18 participants who chose the grade of B, and 2 participants who chose the grade of C. For the post-test, there were 23 participants who chose the grade of A, 30 participants who chose the grade of B, and 4 participants who chose the grade of C. (See Table 11 and Figures VII and VIII).

Table 11. Pre-test and Post-test Prerequisite Course Grade and SRSSDL Frequencies

Pre-test Prerequisite Course Grades and SRSSDL Categories Frequencies		Post-test Prerequisite Course Grades and SRSSDL Categories Frequencies	
	Prereq Course	Grade Prerequisite	

Awareness:	A	B
1	1	
2	1	
3	1	
4	1	
5	1	
6	1	
7	1	1
8	1	
9	1	
10	1	
11	1	
12		1
Toal:	**11**	**2**

Learning Strategies	A	B
1	1	
2	1	
3		1
4		1
5		1
6	1	1
7	1	
8	1	
9	1	
10		1
11	1	
12	1	
Total:	**8**	**5**

Learning Strategies	A	B
1	1	1
2	1	
3		1
4	1	
5	1	
6	1	
7	1	
8	1	
9	1	
10	1	
11	1	

Awareness:	A	B	C
1			1
2			1
3			1
4	1		
5			1
6			1
7			1
8			1
9	1		
10	1		
11	1		
12	1		1
Toal:	**5**		**8**

Learning Strategies	A	B	C
1	1		
2	1		
3			1
4	1		1
5			1
6	1		
7			1
8	1		
9	1		
10			1
11			1
12	1		
Total:	**7**		**6**

Learning Activities	A	B	C
1			1
2			1
3			1
4	1		
5	1		1
6			1
7			1

12	1	
Total:	**11**	**2**

Evaluation

1	1	
2	1	
3	1	
4	1	
5	1	
6	1	
7	1	
8	1	
9	1	
10	1	
11	1	
12	1	
Total:	**12**	

Interpersonal Skills

1	1	
2	1	
3		1
4	1	1
5		1
6	1	1
7	1	
8	1	
9		1
10	1	
11	1	
12	1	1
Total:	**9**	**6**

8		1
9		1
10	1	
11		1
12		1
Total:	**3**	**10**

Evaluation

1	1	
2		1
3		1
4	1	1
5	1	
6	1	
7		1
8		1
9	1	
10		1
11		1
12		1
Total:	**5**	**8**

Interpersonal Skills

1	1	
2	1	1
3	1	1
4		1
5	1	
6	1	
7	1	
8		1
9	1	
10	1	
11	1	
12		1
Total:	**9**	**5**

Figure VII. Pre-test Prerequisite Course Grade and SRSSDL Categories

Pre-test Prerequisite Course Grade and SRSSDL Categories
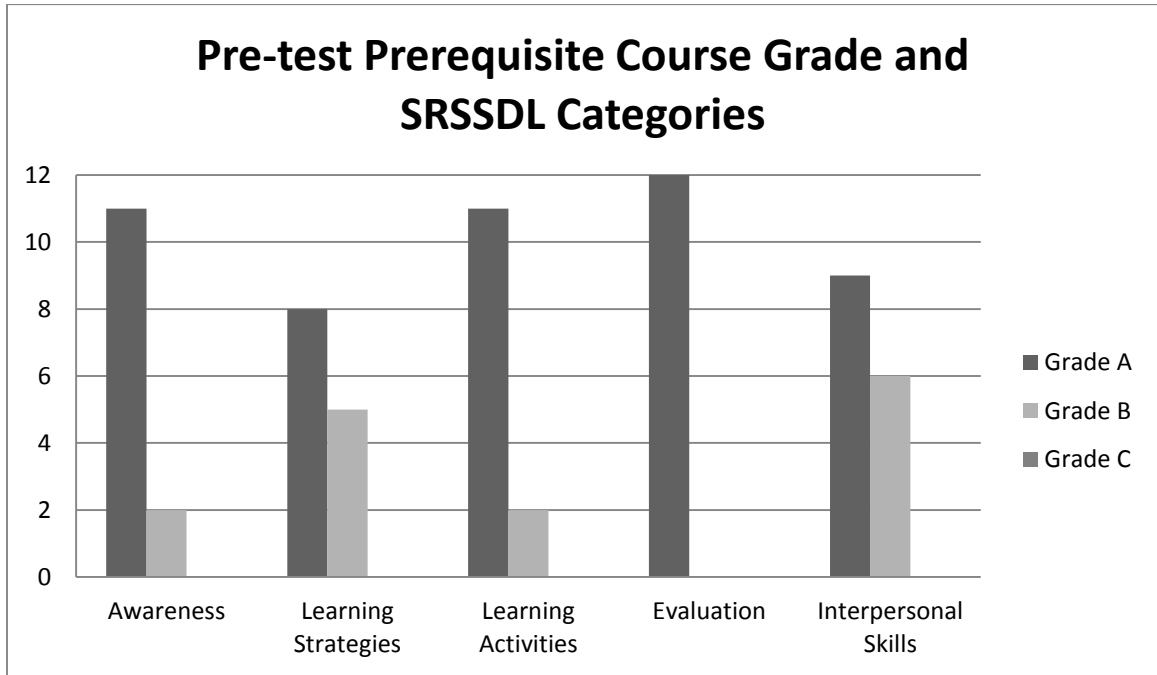
Figure VIII. Post-test Prerequisite Course Grade and SRSSDL Categories
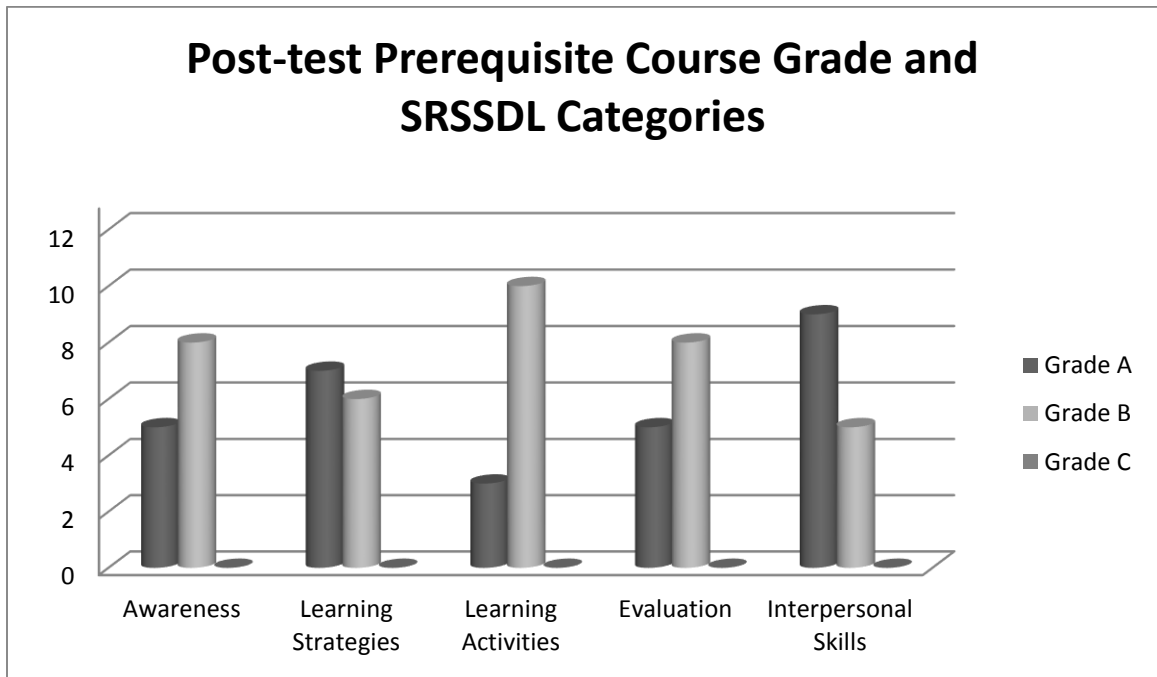
Post-test Prerequisite Course Grade and SRSSDL Categories

The prerequisite course grade of an A for the pre-test and post-test for each category of the SRSSDL tool was: (See Table 12)

Table 12. Prerequisite Course Grade of an A

Prerequisite Course Grade of an A		
SRSSDL Category	**Pre-test Score**	**Post-test Score**
Awareness	11	5
Learning Strategies	8	7
Learning Activities	11	3
Evaluation	12	5
Interpersonal Skills	9	9

The prerequisite course grade of a B for the pre-test and post-test for each category of the SRSSDL tool was: (See Table 13)

Table 13. Prerequisite Course Grade of a B

Prerequisite Course Grade of a B		
SRSSDL Category	**Pre-test Score**	**Post-test Score**
Awareness	2	8
Learning Strategies	5	6
Learning Activities	2	10
Evaluation	0	8
Interpersonal Skills	6	5

The prerequisite course grade of a C was never the highest frequency.

Results. For every category on the pre-test and most of the categories on the post-test, students who received a typical grade of an A in their prerequisite courses stated more "always" in the categories on the SRSSDL. The grade of a C was never the highest frequency. This data shows that students who receive mostly A's in their prerequisite courses and a few B's tend to have a higher SDL score.

Reliability limitations. Limitations of this data analysis were coding errors, extraneous variables that affected the results (such as student recall), and inherent variations in the samples (such as the type of prerequisite courses each student had taken).

Nursing course grade and SDL. Only the highest percentage of "always" answers were taken into consideration when determining the highest frequency for a nursing course grade due to the researcher wanting to see a connection between the type of students who would answer "always" and a typical nursing course grade. For the pre-test, there were 12 participants who chose the grade of A, 24 participants who chose the grade of B, and 6 participants who chose the grade of C. For the post-test, there were 14 participants who chose the grade of A, 34 participants who chose the grade of B, and 9 participants who chose the grade of C. (See Table 14 and Figures IX and X).

Table 14. Pre-test and Post-test Nursing Course Grade and SRSSDL Frequencies

Pre-test Nursing Course Grade and SRSSDL Categories Frequencies			Post-test Nursing Course Grade and SRSSDL Categories Frequencies			
	Nursing A	Course B		Nursing A	Grade B	C
Awareness:			Awareness:			
1		1	1			1
2	1	1	2			1
3		1	3			1

Left column

4		1
5		1
6		1
7	1	1
8		1
9		1
10		1
11		1
12	1	1
Toal:	**3**	**12**

Learning Strategies

1		1
2	1	
3		1
4		1
5		1
6		1
7	1	1
8	1	1
9	1	
10	1	
11		1
12		1
Total:	**5**	**9**

Learning Activities

1	1	
2		1
3		1
4		1
5		1
6	1	
7		1
8	1	
9		1
10	1	
11		1
12		1
Total:	**4**	**8**

Evaluation

1		1

Right column

4		1
5		1
6		1
7		1
8		1
9	1	
10		1
11		1
12		1
Toal:	**1**	**11**

Learning Strategies

1		1
2	1	
3		1
4		1
5		1
6		1
7		1
8		1
9		1
10		1
11		1
12		1
Total:	**1**	**11**

Learning Strategies

1		1	
2		1	
3		1	
4	1		
5		1	
6		1	1
7		1	
8	1	1	
9	1		
10		1	
11		1	
12		1	
Total:	**3**	**10**	**1**

			Evaluation		
2		1	1		1
3	1		2		1
4	1		3		1
5		1	4		1
6		1	5		1
7		1	6		1
8		1	7		1
9	1	1	8		1
10	1	1	9	1	1
11		1	10		1
12	1		11		1
Total:	**5**	**9**	12		1
			Total:	**1**	**12**
Interpersonal Skills					
1	1		Interpersonal Skills		
2	1		1		1
3	1		2		1
4	1	1	3		1
5	1		4		1
6		1	5		1
7		1	6		1
8		1	7		1
9		1	8		1
10	1	1	9		1
11	1	1	10		1
12		1	11		1
Total:	**7**	**8**	12		1
			Total:		**12**

Figure IX. Pre-test Nursing Courses Grade and SRSSDL Categories
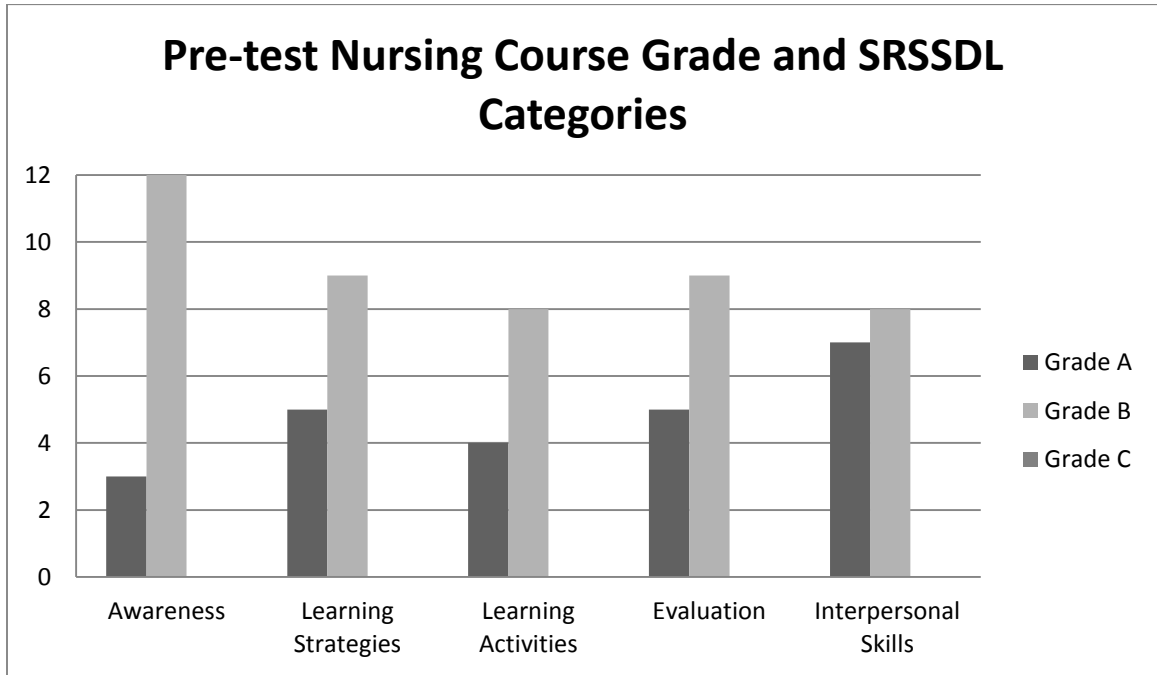
Figure X. Post-test Nursing Courses Grade and SRSSDL Categories
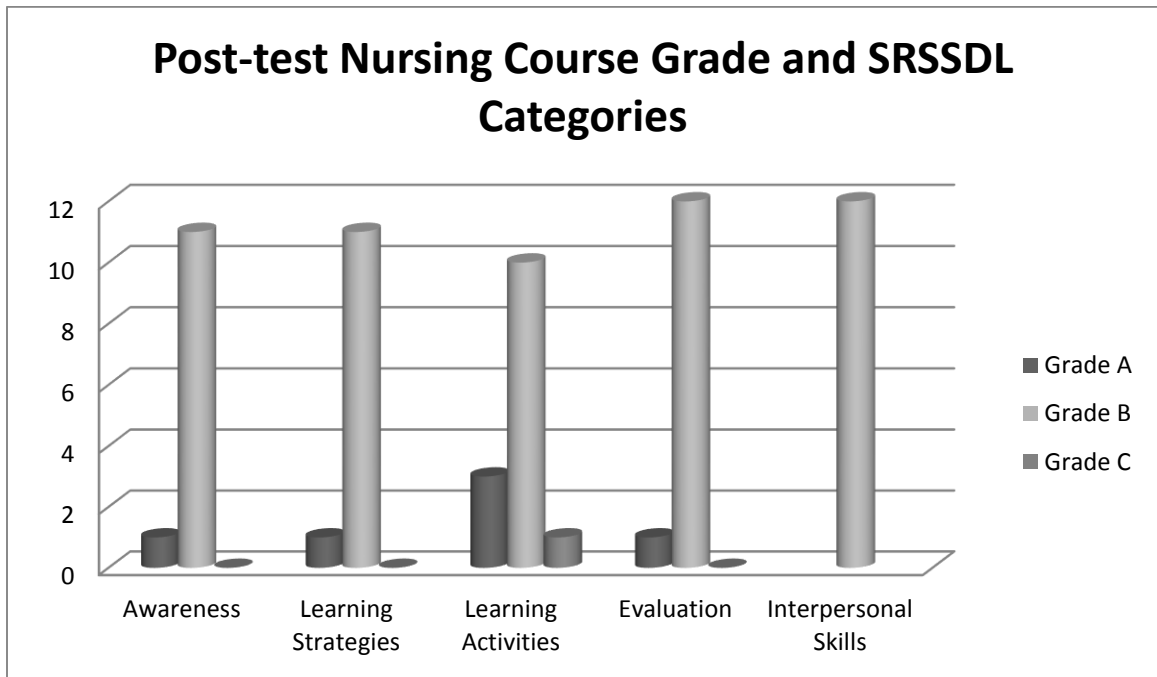
The nursing course grade of an A for the pre-test and post-test for each category of the SRSSDL tool was: (See Table 15)

Table 15. Nursing Course Grade of an A

Nursing Course Grade of an A		
SRSSDL Category	Pre-test Score	Post-test Score
Awareness	3	1
Learning Strategies	5	1
Learning Activities	4	3
Evaluation	5	1
Interpersonal Skills	7	0

The nursing course grade of a B for the pre-test and post-test for each category of the SRSSDL tool was: (See Table 16)

Table 16. Nursing Course Grade of a B

Nursing Course Grade of a B		
SRSSDL Category	Pre-test Score	Post-test Score
Awareness	12	11
Learning Strategies	9	11
Learning Activities	8	10
Evaluation	9	12
Interpersonal Skills	8	12

The nursing course grade of C received only one frequency on the post-test for the learning strategies section.

Results. For nursing courses, the grade of B had the highest frequency more often than the prerequisite nursing courses, which were mostly the grade of an A. This shows that nursing courses probably have a higher difficulty level than prerequisite courses. More students listed an A for nursing courses on the pre-test than for the post-test, showing that the nursing courses they had completed the previous year may have been easier than the course they were currently completing at the time of the post-test. The grade of a C was never the highest frequency. This data shows that students who receive mostly B's and a few A's in their nursing courses tend to have a higher SDL score.

Reliability limitations. Limitations of this data analysis were coding errors, extraneous variables that affected the results (such as student recall of previous grades), and inherent variations in the samples (such as the type of nursing courses each student had taken depending on the term in which they were currently enrolled).

Work Experience and SDL. As stated previously, work experience data was coded using the highest percentages for the "always" and "often" answers and then assigning a point to each highest work experience group to result in counts. For the pre-test, there were 11 participants who stated they had never worked as a CNA, there were 21 participants who stated that they worked as a CNA in long-term care, and there were 13 participants who stated they worked as a CNA in the hospital setting. For the post-test, there were 7 participants who stated they had never worked as a CNA, there were 32 participants who stated that they worked as a CNA in long-term care, and there were 24 participants who stated they worked as a CNA in the hospital setting. (See Table 17 and Figures XI and XII).

Table 17. Pre-test and Post-test Work Experience and SRSSDL Frequencies

Pre-test Work Experience and SRSSDL Categories Frequencies

Awareness:	Work Experience		
	Never CAN	LT C	Hospital
1		2	
2			2
3		1	1
4	1	1	
5	1	1	
6		1	
7		1	
8	1		1
9		1	1
10		1	1
11		1	1
12		1	1
Toal:	**3**	**11**	**8**
Learning Strategies			
1	1		1
2		2	
3	1		
4	1		
5		1	1
6		2	
7	1		1
8		1	
9		1	1
10	1	1	
11	1	1	
12		1	1
Total:	**6**	**10**	**5**
Learning Activities			
1		1	1
2	1		1
3		1	1
4	1		1

Post-test Work Experience and SRSSDL Categories Frequencies

	Work Experience		
Awareness:	No CNA	LT C	Hospital
1	1		1
2		1	1
3	1	1	
4	1		1
5	1	1	
6	1	1	
7	1		1
8		1	1
9		1	1
10	1	1	
11		1	1
12		2	
Toal:	**7**	**10**	**7**
Learning Strategies			
1	1	1	
2	1	1	
3	1	1	
4	1	1	
5	1	1	
6		1	1
7	1		1
8		1	1
9	1		1
10	1	1	
11	1	1	
12		2	3
Total:	**9**	**11**	**7**
Learning Activities			
1	1	1	
2		2	

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	Col1	Col2	Col3
5		1	1
6		1	1
7	1		1
8	1		1
9	1	1	
10	1	1	
11		1	1
12	1		
Total:	**7**	**7**	**9**

Evaluation

	Col1	Col2	Col3
1	1	1	
2	1	1	
3		1	1
4	1	1	
5		1	1
6			1
7		1	1
8	1		1
9	1		1
10		2	
11	1	1	
12	1		1
Total:	**7**	**9**	**7**

Interpersonal Skills

	Col1	Col2	Col3
1		2	
2	1	1	
3		1	1
4		1	1
5	1		1
6	1		1
7		1	1
8		1	
9	1		
10	2		
11		2	
12	1	1	
Total:	**7**	**10**	**5**

	Col1	Col2	Col3
3		1	1
4	1		1
5		2	
6		2	
7	1	1	
8	1		1
9		1	1
10	1		1
11	1	1	
12	1	1	
Total:	**7**	**12**	**5**

Evaluation

	Col1	Col2	Col3
1		1	1
2		1	1
3	1		1
4		1	1
5		1	1
6		1	1
7		1	1
8	1		1
9	2		
10	1	1	
11		1	1
12		1	1
Total:	**5**	**9**	**10**

Interpersonal Skills

	Col1	Col2	Col3
1	1		1
2		1	1
3		1	1
4	1		1
5		1	1
6	1		1
7		1	1
8		2	
9	1	1	
10	1		1
11	1		1
12		1	1
Total:	**6**	**8**	**10**

Figure XI. Pre-test Work Experience and SRSSDL Categories
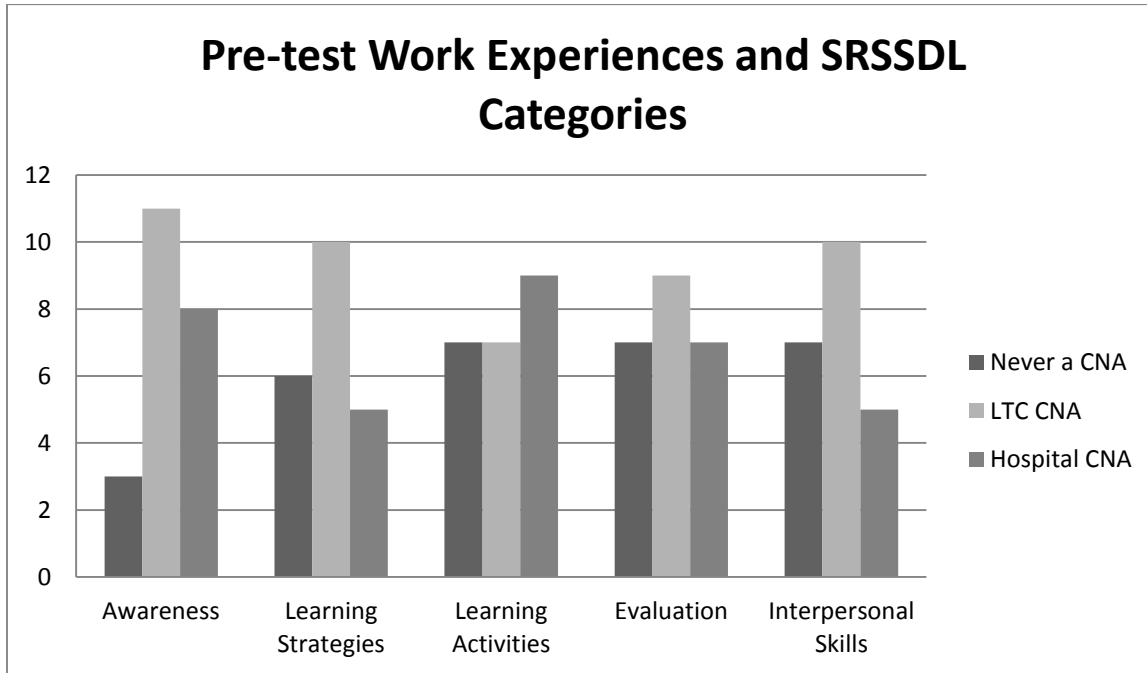
Figure XII. Post-test Work Experience and SRSSDL Categories
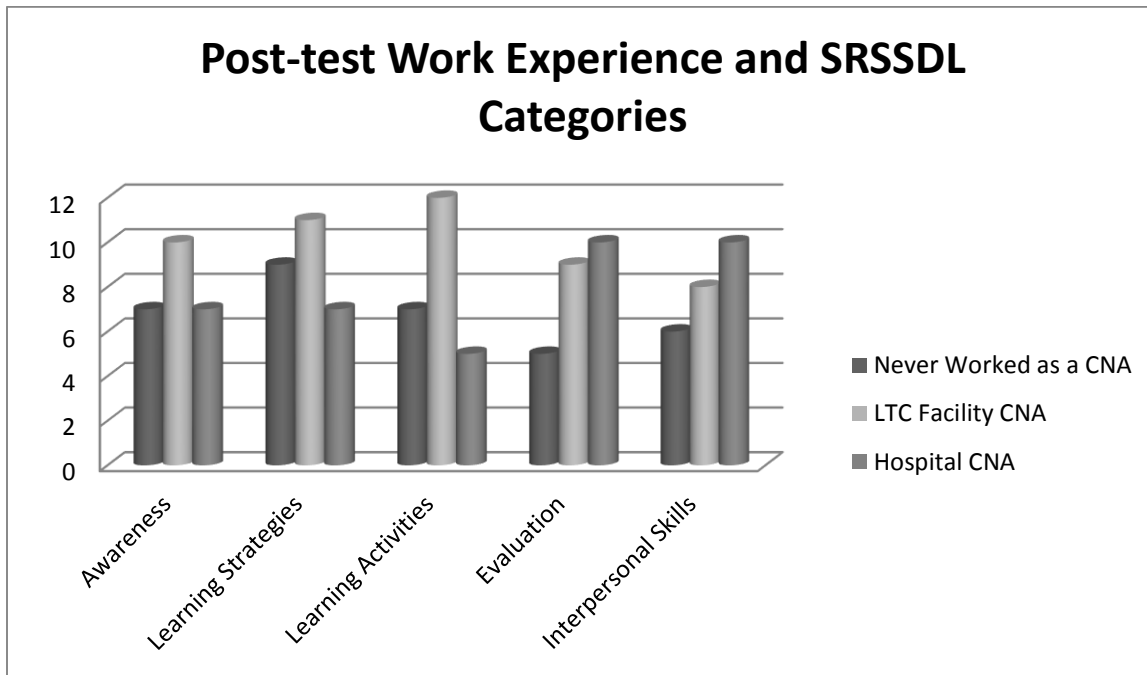
For students who have never worked as a CNA, the SRSSDL category results for the pre-test and post-test were: (See Table 18)

Table 18. Never Worked as a CNA

Never Worked as a CNA		
SRSSDL Category	Pre-test Score	Post-test Score
Awareness	3	7
Learning Strategies	6	9
Learning Activities	7	7
Evaluation	7	5
Interpersonal Skills	7	6

For students who have worked as a CNA in a long-term care setting, the SRSSDL category results for the pre-test and post-test were: (See Table 19)

Table 19. Worked as a CNA in LTC

Worked as a CNA in LTC		
SRSSDL Category	Pre-test Score	Post-test Score
Awareness	11	10
Learning Strategies	10	11
Learning Activities	7	12
Evaluation	9	9
Interpersonal Skills	10	8

For students who have worked as a CNA in a hospital setting, the SRSSDL category results for the pre-test and post-test were: (See Table 20)

Table 20. Worked as a CNA in a Hospital

Worked as a CNA in a Hospital		
SRSSDL Category	**Pre-test Score**	**Post-test Score**
Awareness	8	7
Learning Strategies	5	7
Learning Activities	9	5
Evaluation	7	10
Interpersonal Skills	5	10

Results. For all of the categories overall, the ratings for the CNAs who have worked in long-term care were the highest, followed by those of the students who have worked as a CNA in a hospital. This shows that having CNA experience helps a nursing student have a higher level of SDL due to experience in the nursing field.

Reliability limitations. Limitations of this data analysis were coding errors, extraneous variables that affected the results (such as the student's experience with the job setting or employer), and inherent variations in the samples (such as how many students responded in each category and how many years of experience each of the participants had).

Gender and SDL. As stated previously, gender data was coded using the highest percentages for the "always" and "often" answers and then assigning a point to each highest

gender to result in counts. There were 7 male participants and 92 female participants (See Table

21 and Figures XIII and XIV).

Table 21. Pre-test and Post-test Gender and SRSSDL Frequencies

Pre-test Gender and SRSSDL Categories Frequencies			Post-test Gender and SRSSDL Categories Frequencies		
Gender			Gender		
	Male	Female		Male	Female
Awareness:			Awareness:		
1	1	1	1		2
2		2	2	1	1
3		1	3	1	1
4	1	1	4		2
5	1	1	5	1	1
6	2		6	1	1
7	1	1	7	1	1
8	1	1	8		2
9		2	9		2
10	2		10		2
11	1	1	11	1	1
12	1	1	12	1	1
Toal:	**11**	**12**	**Toal:**	**7**	**17**
Learning Strategies			Learning Strategies		
1	1	1	1	1	1
2	1	1	2	1	1
3		2	3	1	1
4	2		4	1	1
5	2		5	1	1
6	1	1	6	1	1
7	1	1	7	1	1
8	1	1	8	1	1
9		2	9	1	1
10	1	1	10	1	1
11	1	1	11	1	1
12	1	1	12		2
Total:	**12**	**12**	**Total:**	**11**	**13**
Learning Activities			Learning		
1		2			

2	1	1
3		2
4	1	1
5	1	1
6		2
7	1	1
8		1
9	2	
10	1	1
11	2	
12	1	1
Total:	**10**	**13**

Evaluation

1	1	1
2		2
3	1	1
4	1	1
5	1	1
6	1	
7	2	
8	1	1
9	1	1
10	1	1
11	1	1
12	1	1
Total:	**12**	**11**

Interpersonal Skills

1	1	1
2		2
3	1	1
4	1	
5	2	
6	1	1
7	1	1
8	1	1
9	1	1
10		2
11	1	1
12	1	1
Total:	**11**	**12**

Strategies

1		2
2		2
3		2
4	1	1
5	1	1
6		2
7		2
8		2
9	1	1
10	1	1
11		2
12	1	1
Total:	**5**	**19**

Evaluation

1		2
2	1	1
3	1	1
4	1	1
5	2	
6	1	1
7	1	1
8		2
9		2
10	1	1
11		2
12		2
Total:	**8**	**16**

Interpersonal Skills

1	1	1
2		2
3	1	1
4	1	1
5	2	
6	1	1
7	1	1
8		2
9	1	1
10		2
11	1	1

		12		2
	Total:		**9**	**15**

Figure XIII. Pre-test Gender and SRSSDL Categories
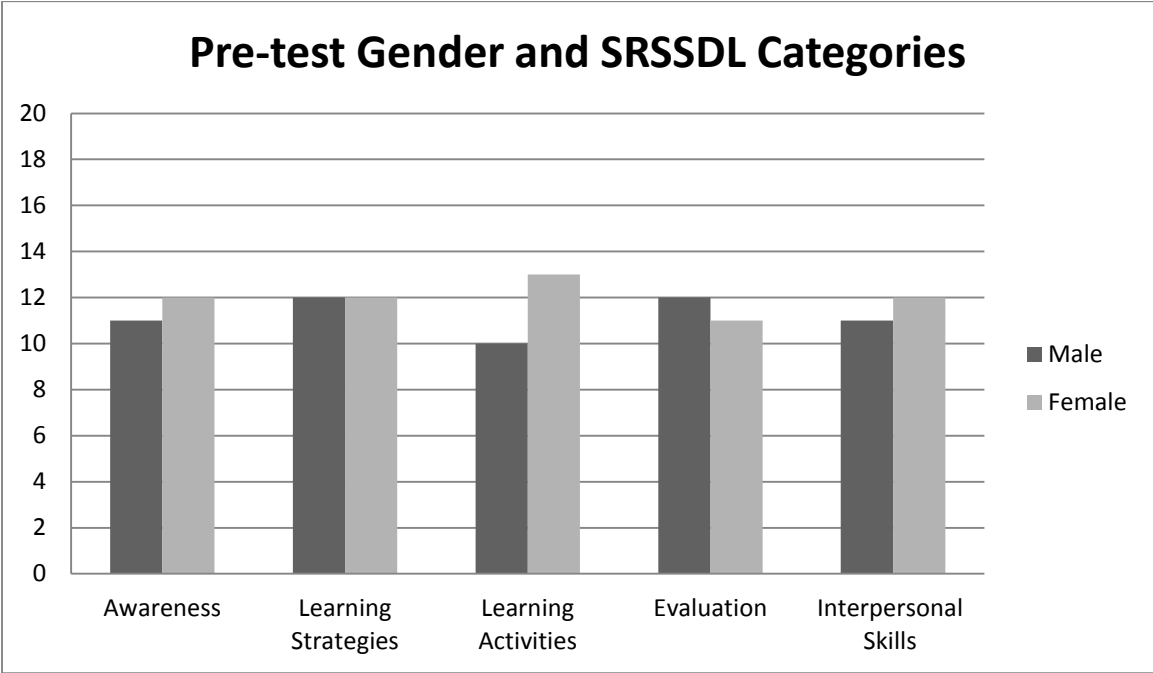

Figure XIV. Post-test Gender and SRSSDL Categories

Post-test Gender and SRSSDL Categories
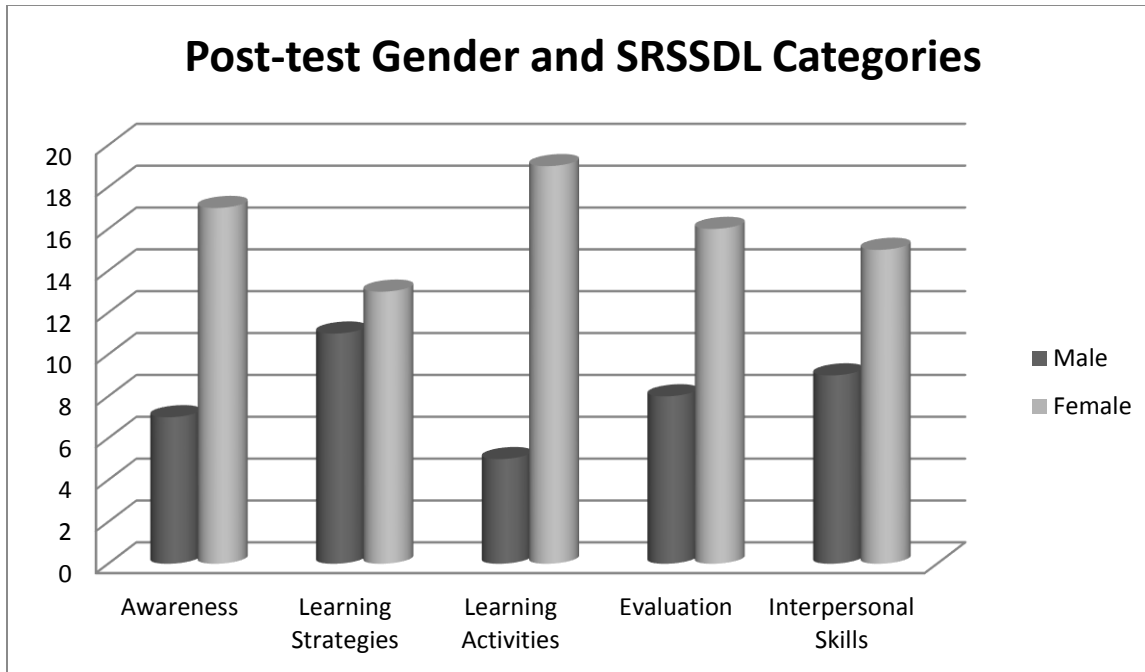
For the male participants, the SRSSDL category scores for the pre-test and post-test were as follows: (See Table 22)

Table 22. Male Participants

Male Participants		
SRSSDL Category	**Pre-test Score**	**Post-test Score**
Awareness	11	7
Learning Strategies	12	11
Learning Activities	10	5
Evaluation	12	8
Interpersonal Skills	11	9

For the female participants, the SRSSDL category scores for the pre-test and post-test were as follows: (See Table 23)

Table 23. Female Participants

Female Participants		
SRSSDL Category	**Pre-test Score**	**Post-test Score**
Awareness	12	17
Learning Strategies	12	13
Learning Activities	13	19
Evaluation	11	16
Interpersonal Skills	12	15

Results. For most of the categories, the female students had more frequencies of "always" and "often" answers than the male students. This could show that females tend to have higher SDL than male students. For each of the categories, the male students' scores decreased between the pre-test and the post-test and the female students' scores increased between the pre-test and the post-test. This could show that male students inherently rate themselves as having a higher SDL score but then the stress of coursework brings that level down by the end of the semester, and the opposite is true for female students, who inherently rate themselves lower until their coursework increases their SDL scores.

Reliability limitations. Limitations of this data analysis were coding errors, extraneous variables that affected the results (such as the life experiences of each gender), and inherent variations in the samples (such as how many students responded in each category).

Limitations

A major limiting factor in this study was that the active learning strategy that was used as the intervention in this project was the use of guided practice in the lab setting, but this did not exclude the use of other types of active learning strategies in theory courses throughout the Midwestern community college nursing program in terms one, two, four, and five. Other faculty use other forms of active learning strategies in the classroom setting, so all students were exposed to some type of active learning strategy, whether they were in the control group or the experimental group. In addition, the inherent differences between lab courses and classroom courses would affect the data.

Another limitation of this study was all of the other extraneous variables that could have impacted the students' ratings on the pre-test and post-test SRSSDL. Extraneous variables included lack of student motivation to study outside of class time, students being distracted during lab guided practice due to life circumstances, students missing labs due to illness, students' level of preparation for lab and class, students responding in a certain way to please the instructor, variability in the knowledge level of the students between the four terms, and a difference in teaching methods of guided practice and active learning strategies (Giddens et al., 2012; Lisko & O'Dell, 2010). It was also recognized during the semester by the director of the nursing program that guided practice was being done differently by faculty in every course across the nursing program. Even faculty teaching the same course had different levels of expectations while in the lab rooms observing a group of students completing the skill. This would alter the results of the study due to a lack of continuity in the intervention (personal communication, K. Ericson, April 14, 2015).

A ranking in SDL scales is based on many demographic characteristics that affected the results of this study in addition to the active learning strategy of guided practice. A student's

gender, age, achievement level, learning type, and internal motivation level, along with other possible variables, impacted the rating each student gave for the SDL scale.

A weakness of this study was that the number of students responding to the questionnaire was small—47 student participants for the pre-test and 59 student participants for the post-test, which meant the power analysis ideal sample size was not achieved. There were also a very low number of respondents in terms 4 and 5 for both the pre-test and the post-test, providing limited data. In addition, the sample was taken from only one nursing school, so the results are not generalizable.

Also, the study involved four terms of nursing students but took place during only one semester of nursing school, so the study does not show longevity, effects on NCLEX pass rates, effects on student attrition rates, or student personal growth. Another weakness of this project is the fact that not all previous research has supported links between SDL and learner attributes or demographics. Results of previous studies varied widely.

Another limitation of the study was that the groupings of demographic variables were very uneven. There were only 7 male respondents compared to 92 female respondents. Age ranges were also skewed, with very few respondents as the age categories increased. In addition, there were up to 6 students in each pre-test and post-test group who did not complete the entire questionnaire, showing that students may not have taken answering the questionnaire seriously.

Another limitation was that the pre-test was sent out later than intended. The goal was to send the pre-test to the students via email during the first three weeks of the semester. Due to it taking longer than anticipated to receive Regis University IRB approval for this study, the pre-

test was not emailed out to students until weeks 5-7 of the semester, making it almost to the halfway point of the semester and not being a true "pre-test" score.

Recommendations

Nursing Education

Based on this study, the researcher recommends continuing the use of active learning strategies in the nursing classroom and lab. The data was inconclusive in that guided practice increased SDL scores, but all of the scores of every term of students increased overall between the pre-test and post-test, showing that the use of active learning strategies is one of the variables that helps to increase a nursing student's SDL. Previous research has shown that active learning strategies help to increase student retention and engagement in nursing courses (Knowles, 1988; & Popkess and McDaniel, 2011). If students are self-directed learners who seek out ways to learn the content in active learning situations in the classroom environment and in a format that works for their learning needs outside of class, then they will hopefully reap the benefits by succeeding on nursing exams and completing their associate of nursing degree (ADN). Nursing students need to be engaged and active in the learning process so that they continue to seek out knowledge and be lifelong learners as they progress in their nursing careers.

Theory

The results of this study support Hildegard Peplau's (1997) Theory of Interpersonal Relations, David Kolb's experiential learning theory (Kolb & Kolb, 2005), and Malcolm Knowles's adult learning theory (Knowles, 1988). All of these theories support the use of active learning strategies to enhance student learning. Active learning strategies should continue to be used in the nursing classroom setting. Anecdotal evidence from students showed that students

are more engaged in the nursing classroom when they are up and moving and involved in their learning rather than sitting and listening to a lecture. Student feedback indicated that students would like small lectures interspersed with active learning strategies.

Research

This study provided insight into what demographic factors impact a student's SDL. All students have inherent demographic traits that may help to increase their level of SDL. This research can be used to make students aware that they have characteristics that inherently make them self-directed learners and to use these characteristics to an advantage. The inherent traits should be emphasized and built upon so a student can continue to increase their SDL.

Implications to Practice

The results and anecdotal evidence are in support of continuing the use of active learning strategies in the nursing classroom. Student feedback indicated that they would like small lectures interspersed with active learning strategies. Students should also be encouraged to take the SRSSDL to allow them to see where they fall on the scale. They should then be encouraged to determine what inherent demographic factors help them to be self-directed learners and then to use those qualities and the SRSSDL tool to continue to increase their levels of SDL while in nursing school and during their careers.

Opportunities for Future Research

If this study were to be repeated, it would be beneficial to conduct a mixed method study combining quantitative and qualitative feedback. This study did not account for the anecdotal feedback from students in support of active learning strategies in the nursing

classroom and lab settings. If this study could be continued in later years, it would be beneficial to study how the use of active learning strategies in the new concept-based nursing curriculum at a Midwestern community college impacts students' SDL as they advance in their careers. A future study could also involve student participants from a variety of nursing schools in both ADN and BSN programs to allow the results to be more generalizable. To enhance the results, a repeat study should involve a nursing program that only uses active learning strategies and a nursing program that strictly uses lecture in nursing courses. Additional research would include a longitudinal study after sustainability to test the effects of active learning strategies on the success of nursing students in nursing courses and their success on the NCLEX.

Conclusion

Nursing students at a Midwestern community college struggled to retain and apply information based on informal student feedback. This capstone project sought to determine if active learning strategies in nursing courses with labs would help nursing students become more self-directed in their learning to improve their ability to retain and apply nursing course information. The active learning strategy that was studied was the use of guided practice, an activity that involves the students rotating throughout four roles to assist each other with learning a new nursing skill. The results of this study were inconclusive that the use of guided practice as an active learning strategy alone increases a nursing student's level of self-directed learning in one semester of nursing school. Guided practice may have been one of several contributors amongst other active learning strategies and inherent individual student characteristics and growth that caused all four terms of students to have higher self-directed learning scores on the SRSSDL tool at the end of the semester than at the beginning of the semester. Active learning strategies should continue to be used in the nursing classroom and lab settings. Students report

that they appreciate the use of active learning strategies rather than strictly lectures, and other research supports the use of active learning strategies to encourage student engagement and learning. Students should also be encouraged to take the SRSSDL to allow them to see where they fall on the scale. They should then be encouraged to determine what inherent demographic factors help them to be self-directed learners and then to use those qualities and the SRSSDL tool to continue to increase their levels of SDL while in nursing school and during their careers as they continue to be lifelong learners.

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Appendix A

Topic	Search Terms	Databases	Level of Research
Active Learning Strategies	**Nursing Education +** Active Learning Strategies + Self-directed Learning or Student Motivation	Academic Search Premier- 2 CINAHL- 4 Medline- 1	Level II- 1 Level III- 1 Level IV- 1 Level V- 1 Level VII- 3
Self-Directed Learning	**Nursing Education +** Self-directed learning + Evaluation or Benefits	CINAHL- 8 Academic Search Premier- 1	Level II- 1 Level III- 2 Level V- 1 Level VII- 1 Tool development- 4
Guided Practice	**Nursing Education +** Peer Group Learning + Skill Acquisition	CINAHL- 3 Academic Search Premier- 1 PsycINFO-1	Level II-1 Level III- 2 Level IV- 1 Level VI- 1

Appendix B

Informational Sheet for Participation in a Capstone Project Study:

Assessing the Use of Active Learning Strategies to Increase Learning Self-Directedness in DMACC Nursing Education

Study Purpose: To determine the effects of active learning strategies, specifically guided practice in the nursing lab setting, on the level of nursing student self-directed learning using a self-rating scale of self-directed learning tool. This research study is being conducted by a nursing doctoral student and is required for a Doctorate of Nursing Practice degree.

Expectation of Participants: Participation in this study is voluntary and participants can withdraw from the study at any time without any penalty. Participation in this study will in no way affect your course grade. Participants will be asked to fill out an electronic questionnaire of 60 questions within the first 4 weeks of the semester and again during the last 4 weeks of the semester.

Maintaining Confidentiality: The questionnaires will be anonymous and computer-generated. They will include no identifying information that can link individual students to response information. Data will be analyzed in aggregate form by term of students.

Demographic Disclaimer: The demographic questions included at the end of the questionnaire tool are voluntary and not required to participate in the study.

Doctoral Student Researcher Contact Information:

Janelle Tungesvik, MSN, BSN
Instructor of Nursing, DMACC, Boone campus
Phone: 515-433-5073
Email: jatungesvik@dmacc.edu

Regis University Capstone Chair Contact Information:

Dr. Colleen McCallum, DNP, RN, FNP-C
Assistant Professor: Rueckert-Hartman College for Health Professionals
Phone: 303-964-6498
Email: cmccallu@regis.edu

Regis University IRB Contact Information:

IRB, Regis University
Main Hall, Room 452, Mail Code H4
Denver, CO 80221
Email: irb@regis.edu

The Regis Institutional Review Board (IRB) review and approves all research involving human subjects at Regis University. If you as a subject have questions about this process, you may contact the IRB directly at (303) 458-4206 or via email at irb@regis.edu

Appendix C

Appendix D

Problem
- Students can not apply and do not retain information presented in traditional lecture format
- DMACC nursing has a 30% attrition rate
- DMACC is in the process of switching to a concept-based curriculum

Inputs
- Support from other nursing faculty teaching courses in the program to continue guided practice and active learning strategies
- Free access to guided practice description and documents on a DMACC internal computer drive
- Support from nursing program director to conduct study
- Nursing curriculum that supports the use of active learning strategies
- Original developer of the guided practice documents still works at DMACC
- Tool to assess student SDL
- Assistance to monitor and organize data
- Nursing students in multiple courses able to participate in active learning

Activities
- Engage the students in an active learning strategy involving peer guided practice in the lab skill setting
- Implement the use of guided practice across the curriculum at the Boone campus nursing program
- Students will be exposed to learning a variety of nursing skills using guided practice during a nursing lab course
- Students will increase in the complexity of skills they are learning with guided practice as they progress through the nursing program

Outputs
- Student self-rating of self-directed learning tool:
- Students will show an increase in self-directed learning scores on post-test questionnaires
- Students will state that they find an active learning environment meets their learning needs
- Faculty will provide positive feedback about the use of guided practice in their lab courses and the use of active learning strategies in general

Outcomes
- Short-term: Increased student self-directed learning
- Short-term: Students will report positive feedback about the active learning environment and specific strategy
- Short-term: Increased student comfort level with an active learning environment
- Short- and Long-term: Students will be able to apply the knowledge they learned in this activity
- Short- and Long-term: Students will retain information they learned in the active learning activity
- Short- and Long-term: NCLEX pass rates will rise as a result of better retention and application of learned material
- Short- and Long-term: Students will have lower attrition rates from the DMACC nursing program

Impact
- Use of active learning strategies instead of lecture in nursing course classrooms at DMACC
- Use of guided practice in the lab courses across the nursing curriculum at DMACC
- Use of active learning strategies is encouraged and used in a concept-based curricu 94

Constraints
- Lack of time in class or preparation for class
- Students with different learning needs
- Students who do not fully participate
- Technology fails
- Lack of faculty support or acceptance of change
- Lack of support from program director
- Unavailable support resources for guided practice
- Student refusal or absence when filling questionnaire

Appendix E

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI)
HUMAN RESEARCH CURRICULUM COMPLETION REPORT
Printed on 06/05/2014

LEARNER   Janelle Tungesvik (ID: 4196797)
DEPARTMENT   Doctorate of Nursing Practice
EMAIL   patte558@regis.edu
INSTITUTION   Regis University
EXPIRATION DATE 06/04/2017

SOCIAL BEHAVIORAL RESEARCH INVESTIGATORS AND KEY PERSONNEL

COURSE/STAGE: Basic Course/1
PASSED ON: 06/05/2014
REFERENCE ID: 13171321

REQUIRED MODULES	DATE COMPLETED
Introduction	06/05/14
History and Ethical Principles - SBE	06/05/14
The Regulations - SBE	06/05/14
Assessing Risk - SBE	06/05/14
Informed Consent - SBE	06/05/14
Privacy and Confidentiality - SBE	06/05/14
Regis University	06/05/14

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid Independent Learner. Falsified information and unauthorized use of the CITI Program course site is unethical, and may be considered research misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator

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Appendix F

Academic Grants

3030 Regis Boulevard,   4
Denver, CO 80221-1099

303-458-4206
303-964-5498 fax
www.regis.edu

IRB   REGIS UNIVERSITY

February 3, 2015

Janelle Tungesvik
1210 First Street
Boone, IA 50036

RE: IRB #: 15-056

Dear Ms. Tungesvik:

Your application to the Regis IRB for your project, "The Intervention of Active Learning Strategies to Increase Nursing Student Self-Directed Learning", was approved as an exempt study on February 2, 2015. This study was approved per exempt study category of research 45CFR46.101.b(#1).

The designation of "exempt" means no further IRB review of this project, as it is currently designed, is needed.

If changes are made in the research plan that significantly alter the involvement of human subjects from that which was approved in the named application, the new research plan must be resubmitted to the Regis IRB for approval.

Sincerely,

Patsy Cullen

Patsy McGuire Cullen, PhD, PNP-BC
Chair, Institutional Review Board
Professor & Director
Doctor of Nursing Practice & Nurse Practitioner Programs
Loretto Heights School of Nursing
Regis University

cc: Patsy Cullen, PhD

A JESUIT UNIVERSITY

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Appendix G

DMACC
DES MOINES AREA
COMMUNITY COLLEGE

Dr. Janet E. Emmerson
Director of Institutional Research
Des Moines Area Community College District
2006 S. Ankeny Blvd.
Ankeny, IA 50021

IRB
Regis University
Main Hall, Room 452, Mail Code H4
3333 Regis Boulevard
Denver, CO 80221

November 22, 2014

Dear Committee,

As an authorized representative of Des Moines Area Community College (DMACC), I have reviewed Janelle Tungesvik's proposal for research at Des Moines Area Community College titled Assessing the Use of Active Learning Strategies to Increase Learning Self-Directedness in DMACC Nursing Education.

It is understood that as part of this study Janelle will be using anonymous pre-post survey data to determine the efficacy of using a guided-practice learning strategy to increase students' ability to be self-directed learners.

Pending approval from the Regis University's Institutional Review Board (IRB) and subsequent review of these materials by my office, she has permission to conduct this study. A copy of the approved IRB materials will need to be submitted to my office. Kendra Ericson, Director of Nursing Education will serve as her DMACC sponsor for this project and will provide assistance as needed.

If you or other parties associated with this research have questions, please contact me at the address above or at (515) 964-6476 or jemmerson@dmacc.edu.

Sincerely,

[signature]

Janet E. Emmerson

cc.   Janelle Tungesvik, MSN, BSN
       Des Moines Area Community College
       jatungesvik@dmacc.edu

       Dr. Colleen McCallum, DNP, RN, FNP-C
       Assistant Professor, Rueckert-Hartman College for Health Professionals
       cmccallu@regis.edu

Swapna Williamson <Swapna.Williamson@uwl.ac.uk>
Sat 9/13/2014 1:11 PM
To:Tungesvik, Janelle A;

Dear Janelle,

Thank you for the e-mail.
I am glad to hear that you want to use my SRSSDL tool for your research project.
The following are the conditions for the use of the SRSSDL tool:

1. Cite the following reference in any report or publication in which the SRSSDL is used:
   Williamson SN (2007). Development of a self-rating scale of self-directed learning. Nurse Researcher.14(2) 66-83.
2. Share the results with me so that I can further develop the scale.
3. The Self-Rating Scale for Self-Directedness in Learning (SRSSDL) should only be used for research and educational purposes.

Best wishes,

Swapna
Dr. Swapna Williamson PhD, M MEd, SFHEA, MSc (Nursing), BSc Nursing, LLB, BA, RN RM
Associate Professor
University of West London
College of Nursing, Midwifery and Healthcare
Paragon House
Boston Manor Road
Brentford
Middlesex TW8 9GA
Telephone 020 8209 4056

Tungesvik, Janelle A
Fri 9/12/2014 4:18 PM
Doctorate; Sent Items
Hello Dr. Williamson,
I am a doctor of nursing practice student in the state of Iowa in the United States. I am working on a Capstone project for my DNP involving self-directed learning and active learning strategies. I am wanting to ask permission to use your tool in my research. I have already received permission from Lucia Cadorin and she is the one who advised I contact you as well. Can you tell me how I can obtain your permission to use the tool you created in the factor analysis of the Italian version article? Thank you for your time.

Janelle Tungesvik, MSN, BSN

Instructor of Nursing
Des Moines Area Community College
1125 Hancock Drive, Boone, IA 50036
Office Room B-168
Office- 515-433-5073; Cell 515-709-0129
jatungesvik@dmacc.edu

DMACC
DES MOINES AREA
COMMUNITY COLLEGE

November 25, 2014

Regis University
Loretto Heights School of Nursing
3333 Regis Blvd Mail Stop G-8
Denver, CO 80221-1099

Dear DNP chair and Regis University committee review,

This is a letter of support for Janelle Tungesvik, who has requested to conduct her DNP capstone project at Des Moines Area Community College (DMACC) nursing program. The DMACC nursing program comprises 5 campus locations in the central Iowa area serving around 400 pre-licensure nursing students. Janelle's DNP project will provide enrichment to our program with her educational findings that will contribute to improved student learning outcomes and overall strengthen the curriculum.

An additional support letter will be provided on behalf of the Institutional Effectiveness department that oversees all research that is conducted at DMACC. If you need any further information do not hesitate to contact me. As a program, we are in full support of Janelle's DNP efforts and look forward to seeing her study results.

Sincerely,

Kendra Ericson, MSN, RN
DMACC- Director of Nursing Education
2006 S. Ankeny Blvd.
Building 24 – 212J
Ankeny, IA 50021
Office: 515-964-6466
Cell: 515-537-5313
FAX – 515-965-6008
kmericson@dmacc.edu

Ankeny Campus	Boone Campus	Carroll Campus	Newton Polytechnic Campus	Urban Campus	West Campus
2006 S. Ankeny Blvd.	1125 Hancock Dr.	906 N. Grant Rd.	600 N. 2nd Ave. W.	1100 7th St.	5959 Grand Ave.
Ankeny, IA 50023-3993	Boone, IA 50036-5399	Carroll, IA 51401-2525	Newton, IA 50208-3099	Des Moines, IA 50314-2997	WDM, IA 50266-5302
515-964-6200	515-432-7203	712-792-1755	641-791-3622	515-244-4226	515-633-2407

PROJECTED TIMELINE

Jan-April 2015
- January-April 2015
- Administer SRSSDL pretest in January
- Intervention of guided practice in lab courses for the semester

April 2015
- April 2015
- Administer SRSSDL posttest

May-August 2015
- May-July 2015
- Analyze results and form conclusions
- July-August 2015- Disseminate information

Appendix L

BUDGET AND RESOURCES

- Cost of replication of the study
  - Rent a classroom- $50-$300
  - Survey software or copy costs- $10-$100
  - Statistician $200
  - Statistical Analysis Program- $100-$300
  - Willing college, faculty, and students
  - Weekly cost of working with students in the classroom on guided practice-$100/week
  - Average cost of nursing school
  - Faculty Salary