Retention of students in a diploma nursing program in the southern United States

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RETENTION OF STUDENTS IN A DIPLOMA NURSING PROGRAM IN THE SOUTHERN UNITED STATES

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

The School of Human Resource Education and Workforce Development

by

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M.S.N., Southeastern Louisiana University, Hammond, 1996
August 2010
DEDICATION

This work is dedicated to my family who always valued education and continuously supported me in reaching this personal goal. My grandparents, Sr. Mary Ita, my parents, siblings, nieces and nephews, aunts and uncles all provided support and encouragement for me throughout all of my educational pursuits. From natural curiosity as children that led “the three little ones” to experiment with red paint, to this point in more specifically designed research, the goal has always been the same – to discover, to learn, to know something more. My Dad posed a question to us when we discussed our desires, “Is it necessary?” Simple words that helped us recognize wants from needs and to make value-based decisions. My family understands that for me, this was necessary. They understood when I spent hours on school work that should have been shared with them. They understood when I could not visit as often as I wanted. They understood when projects with them were delayed. They understood that they were giving me the room I needed to be me.
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Jan, you may not have understood what I was studying, but you were always willing to listen to me talk about it incessantly. Thanks for all of the coffee, bag lunches and dinners out! You were a good listener and great proofreader.

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ABSTRACT

Registered Nurses comprise the largest group of healthcare professionals in the United States, and forecasts predict a nursing shortage of epic proportions on the horizon. Significant factors include approaching retirement of Baby Boomer RNs, increased demand for care for aging Baby Boomers in the population, approaching retirement of nurse educators, and rejection of qualified applicants secondary to enrollment restrictions in nursing programs. Nursing student attrition further contributes to the pending shortage. Successful retention programs promote best-practice utilization of scarce resources. Understanding student characteristics serves as a basis for effective selection and retention programs.

This study described characteristics of nursing students in a diploma nursing program in the southern United States who graduated within the expected program length; a time frame non-inclusive of completion of 25 credit hours of specified prerequisite general education courses. Using secondary data from students enrolled between January 1998 and January 2008 yielded outcome data for cohorts graduating between December 1999 and December 2009 (or are projected to graduate in December 2010).

This 11-year sample allowed description of students and graduates on demographic characteristics of age, race, gender, marital status during program enrollment, and number children. Further, program admission criteria required completion of the Nurse Entrance Test (NET®) with required minimum critical thinking scores for main idea of passage, inferential reading and predicting outcomes and a minimum composite percentile. Graduates are described according to NET® components, GPA for prerequisite courses and a program predictive GPA for specified prerequisite courses. The study describes the program Non-completers on academic and demographic characteristics and withdrawal factors. Further, comparison was made between program Completers
and Non-completers. This comparison of admission criteria between the groups yielded statistically significant differences between the groups and provided support for admissions criteria utilized by the Admissions and Selections Committee.

Comparison of retention among students experiencing interruption in enrollment was made using the same admission criteria. Admission criteria selected did not yield statistically significant differences between groups. This lends support to the admission criteria being significant to overall selection; however, following readmission, unidentified variables may have a greater influence on the student’s ultimate retention in the program.
CHAPTER 1

INTRODUCTION TO THE RESEARCH

Healthcare today is facing its own version of a “Perfect Storm.” A storm that began building in the 1990’s when futurists began predicting that changes to reimbursement would result in a radically different delivery model with a tremendous reduction in the number of hospital beds (Nevidjon & Erickson, 2001) and subsequently a reduction in the hospital-based registered nursing workforce. Registered nurses (RNs) are the largest single healthcare profession in the United States, and RNs began leaving the profession, and student candidates opted for other educational fields based on employee layoffs and the shifting workplace treatments spawned by these predictions. Predictions are that the most significant impact will begin shortly after the year 2010, as Baby Boomer nurses retire and their fellow Baby Boomers will most likely have increased need for utilization of services (Berlinger & Ginzberg, 2002). Although nursing shortages have historically been cyclical events, Nevidjon and Erickson (2001) noted that key differences at this time include the advanced age of the current nursing workforce, the lack of available support personnel in ancillary fields, and the international nature of this shortage.

Central to the crisis today is the convergence of significant supply and demand factors. The demand continues to grow as an aging Baby Boomer population presents increased demands for healthcare. Reimbursement issues impact hospitals’ ability to remain competitive with compensation. Hospitals are having difficulty retaining new nurses and the aging RN workforce is rapidly approaching retirement. On the supply side, issues relate to a faculty shortage that is fueled by an aging faculty workforce. This is coupled with a decline in nurses seeking advanced degrees specific to nursing education. Even with this decline, the faculty shortage contributed to the NLN’s 2005 National Nursing Education Database Survey compiled data that the estimated number of qualified applications
rejected by nursing programs was 147,465 applicants (Klestzick, 2005). Additionally, National League for Nursing (NLN) figures indicated the growth rate of new admissions by prospective students fell by more than 47% in 2004-2005 (Klestzick, 2006).

Tremendous coverage has been given to the aging of the population, the increased life expectancy of this generation and the healthcare impact the Baby Boomers will create. Donley (2005) noted specific statistics related to nursing practice in the United States (U.S.) to include, among other breakdowns, the following information. Of the 2.8 million RNs in the U.S., 80% are currently practicing and 59% work in hospitals. As we entered the new century, the average age of the RN was estimated to be 45.2 years. Master’s prepared nurse educators had a mean age of 48.8 years, compared to 53.3 years for doctoral level nurse educators. American Nurses Association (2006) reported a slight increase to 2.9 million and an 83.2% employment rate, with a drop to 56.2% employed in hospitals. Further, “increased workload and the desire for better compensation and career advancement opportunities were cited as the leading factors motivating job changes in health care” (Trossman, 2006, p. 6). It was reported that 68% of healthcare workers experience persistent increases in workloads over the past six months. Two-thirds expressed the heavy workloads created stress at work and at home and half of these nurses have difficulty balancing personal and professional commitments. At least 50% of RNs surveyed were dissatisfied with the level of compensation as it related to their effort put forth on the job according to Trossman (2006).

The American Association of Colleges of Nursing (AACN) reported that it is estimated that the U.S. shortage of registered nurses will increase to 340,000 by the year 2020 and “it is expected to increase by three times the current rate over the next 13 years” (American Association of Colleges of Nursing, 2007, p. 1). Further, the AACN (2007) indicated that an Aging Workforce Survey in July
2006 showed that 55% of nurses surveyed intended to retire between 2011 and 2020. Also noted by the AACN was the Health Resources and Services Administration (HRSA) projection that the nation’s RN shortage would grow to more than one million nurses by the year 2020 and all 50 states would experience the shortage by the year 2015.

Additionally, previous shortages were relieved by increased recruitment efforts to obtain nursing students. As job market pressures increased wages and compensation, more candidates applied to nursing school (Heinz, 2004). Today, interest in enrollment in basic nursing programs is significantly impacted by the expanding choices available for women today. “Work conditions such as evening, night and weekend shifts, or the exposure to contagious elements are cited as reasons that young people do not perceive nursing as a positive career choice” (Nevidjon & Erickson, 2001).

Furthermore, the current situation is compounded by a shortage of nursing faculty and the increasing number of faculty retirements slated for the next 10 years (Hinshaw, 2001). Magner (1999) indicated that the faculty shortage is not unique to nursing, citing that the nation’s full-time faculty members age 55 or older account for nearly a third of the total faculty population, which is an increase within the last decade from the previous one-fourth of the population. With nursing education, it is noted that while compensation for bedside caregivers continued to increase in a competitive market, the educators have not benefited from adjustments in compensation at the same rate. This translates to fewer nurses opting for career paths that lead to nursing education.

In order to provide even minimal relief to the struggling workforce, nursing programs nationwide have been searching for innovative methods for curriculum re-design and partnerships with practicing nurses to help increase enrollments. Educational programs face budget cuts that prevent expansion of enrollment and sometimes even reduce student numbers (Parish, 2006). Legislation and
partnering projects promote investment in nursing education and provide a mechanism to make positive in-roads in the nursing educational arena (White, 2006).

Further efforts are being made to attract young men and minority students to the profession of nursing (Hinshaw, 2001). Consequently, AACN figures indicated 42,866 qualified applicants were turned away from U.S. baccalaureate and graduate nursing programs in 2006 due to insufficient number of faculty, clinical sites, classroom space, clinical preceptors and budget constraints. AACN data reported a 7.6% enrollment increase in 2006. However, the total RN population is showing a decrease in growth rate. Between 1992 and 1996, there was a reported 14.2% growth rate and a comparatively low increase of 7.9% for 2004 (American Association of Colleges of Nursing, 2007).

Benner, Sutphen, Leonard, and Day (2010, p. 9) in responding to projections about the impact of culmination of pressures exerted on the nursing profession today noted that the result is a current and future state that threatens “to compromise nurses’ ability to practice state-of-the-art nursing and enact the professions’ core values of care and responsibility.” The authors further noted that any national efforts to alleviate the faculty shortage will not yield immediate results and programs must generate change from within during this crisis. High-quality nursing education must be maintained and admission criteria must continue to represent appropriate entry standards.

Thus, recruiting more students is a challenge of its own and the greater significant impact will be realized only if the nursing program can increase the retention of students. Some figures reported nursing student attrition in excess of 25% for a program and with a 50% attrition rate existing within certain courses (Waters, 2006). Once a student enters the nursing curriculum, the student’s withdrawal from the program represents a void that cannot be refilled within the cohort. Successful retention programs are a key to best-practice utilization of scarce and dwindling faculty resources. This creates a
significant challenge for the nursing program, as Tinto (1993) noted “more students leave their college or university prior to degree completion than stay” (p. 1) and further description was given to the fact that although the answer is not yet available, we must attempt to distinguish the attributes that are specific to successful students.

Educational preparation for entry into practice as a registered nurse applicant has generally occurred along one of three pathways that allow graduates to submit an application for initial licensure to the state level board of registered nursing. Approval of this application permits a registered nurse applicant to sit for the national licensing exam, known as the National Council Licensing Exam for Registered Nurses (NCLEX-RN). The three traditional pathways require two, three or four years of study. The associate degree in nursing, designated as an AD or ADN, generally occurs in a community college setting. This entry pathway has a curriculum focused on technical aspects of nursing. The course of study occurs within four to five semesters. The diploma nursing program is affiliated with an accredited hospital and the curriculum focus is acute care bedside nursing. The course of study begins with prerequisite general education courses. These courses represent arts and sciences courses designed to serve as a basis for the nursing courses in the diploma program curriculum. Courses generally include English composition, college algebra, human anatomy and physiology, several psychology courses, nutrition, microbiology and chemistry. Upon entry to the diploma program, the nursing curriculum includes basic-to-complex nursing courses which combine classroom theory and clinical practice hours and are presented over a two-year time frame. The baccalaureate degree is presented in a four-year college or university setting and is designated as a bachelor’s of science in nursing (BSN). This four-year degree includes a focus on management, research and community nursing. Additional pathways continue to emerge in response to the nursing shortage. Among these
alternative pathways are a fast-track second baccalaureate degree program and a master’s degree program for students who possess a related baccalaureate degree. These programs have varied time frames for completion, usually between 14 and 24 months of year-round study.

**Rationale**

As the nursing shortage looms and healthcare needs of the public are threatened, it is important to determine means to maximize the education of a nursing workforce to face this health crisis. Even though diploma nursing programs represent only a small percentage of entry-level preparation programs today, the effectiveness of the their programs and the performance of their graduates continues to support the viability of diploma nursing education in the educational arena. Research studies related to diploma nursing programs are underrepresented in the literature when compared to associate and baccalaureate entry level nursing programs. However, a recent doctoral dissertation focused on program success of diploma nursing programs, Markey (2010) found that “diploma nursing programs are excellent programs that consistently demonstrate high pass rates on the NCLEX-RN licensure examination and are a viable entry into the practice of registered nursing” (p. 151). As all program types are considered, it is important to maximize the enrollment numbers and graduation rates from nursing programs.

**Purpose of the Study**

This study sought to determine factors which influence nursing student retention. The study described nursing students enrolled in a diploma nursing program in the southern United States to provide an overall picture of the program graduates and to determine if retention of the students could be attributed to the program’s admission criteria. Further, it sought to determine, through comparison of subgroups, if a relationship existed between retention and admission criteria. Additionally, the
impact of interruption in study was examined through comparison of completion status of students who experienced this academic event. Figure 1 provides a schematic of the relationship between these student subgroups. The enrolled students were described on demographic characteristics and admission criteria.

Figure 1. Relationships Between Student Groups and Subsets in the Diploma Nursing Program
Schematic of relationship between total group of enrolled students and subsets described and compared in research objectives. Completers denote retention, whether enrollment was continuous or interrupted. Non-completers denote attrition, whether from failed readmission or lack of readmission.

**Limitations**

The limitations of the study include the specific sample used for the study. This sample represents enrollment at a single diploma nursing program, during the defined period from January 1998 through December 2009. This limits the time frame for consideration to this specific 12 year period representing 11 enrollment classes of students. As school records, both students’ records and administrative records, were used to retrieve the data, the data accuracy is limited by what was recorded in the described files and by the accuracy with which it was extracted. Data were presented in a Microsoft Excel spreadsheet format.
The study is further limited by the parameters for admission utilized by the diploma program utilized. Admission criteria restrict the grade point average required for consideration to 2.7 or higher. The use of an entrance test, the NET®, with required minimum scores also presents a limitation through the further restriction of the range of possible values for each student in the study.

**Research Objectives**

This study utilized secondary data from students enrolled in a diploma program in the southern United States. The research objectives are as follows:

1. To describe students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 were Completers, having graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) on the following demographic characteristics:
   a. Age
   b. Race
   c. Gender
   d. Marital status at enrollment
   e. Marital status at completion
   f. Number of children during enrollment
   g. Completion status relative to program length

2. To describe students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 who were Completers, having graduated from the program between December 1999 and December 2009
(or are projected to graduate in December 2010) on selected program admission criteria:

a. Nurse Entrance Test (NET®) composite percentile,

b. NET® Critical Thinking Scales,
   i. Main Idea of Passage,
   ii. Inferential Reading,
   iii. Predicting Outcomes,

c. Calculated Grade Point Average (GPA) for 25 of required college prerequisite courses, and

d. Calculated Predictive Grade Point Average (PGPA) for program predictive college prerequisite courses (College Algebra, English Composition, Human Anatomy, Human Physiology and selected remaining course with the highest earned letter grade).

3. To describe students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 but were Non-completers, because they withdrew or were dismissed and never graduated from the program, on selected admission criteria and academic characteristics:

a. Nurse Entrance Test (NET®) composite percentile,

b. NET® Critical Thinking Scales,
   i. Main Idea of Passage,
   ii. Inferential Reading,
   iii. Predicting Outcomes,
c. Calculated Grade Point Average (GPA) for 25 hours of required college prerequisite courses, and

d. Calculated Predictive Grade Point Average (PGPA) for program predictive college prerequisite courses (Algebra, English Composition, Human Anatomy, Human Physiology and selected remaining course with the highest earned letter grade).

e. Amount of program completed based on semester enrolled at time of withdrawal or dismissal from school,

f. Enrolled courses at the time of withdrawal or dismissal from school, and

g. Reason for withdrawal or dismissal from school.

4. To compare students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 and were Completers, having graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) with students who were Non-completers, because they withdrew or were dismissed and never graduated from the program, on selected admission criteria:

a. Nurse Entrance Test (NET®) composite percentile,

b. NET® Critical Thinking Scales,

   i. Main Idea of Passage,

   ii. Inferential Reading,

   iii. Predicting Outcomes,

c. Calculated Grade Point Average (GPA) for 25 hours of required prerequisite college courses, and
d. Calculated Predictive Grade Point Average (PGPA) for program predictive prerequisite college courses (Algebra, English Composition, Human Anatomy, Human Physiology and selected remaining course with the highest earned letter grade).

5. To compare students who were enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 who were Completers, having graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) and experienced interrupted study with students who were Non-completers, because they withdrew or were dismissed for a second failure after readmission and never graduated from the program on selected admission criteria:

a. Nurse Entrance Test (NET®) composite percentile,

b. NET® Critical Thinking Scales,
   
   i. Main Idea of Passage,
   
   ii. Inferential Reading,
   
   iii. Predicting Outcomes,

c. Calculated Grade Point Average (GPA) for 25 hours of required prerequisite college courses, and

d. Calculated Program Predictive Grade Point Average (PGPA) for program predictive prerequisite college courses (Algebra, English Composition, Anatomy, Physiology and selected remaining course with the highest earned letter grade).
Significance of the Study

Many studies support the correlation between adequate registered nurse staffing levels and safe patient care (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Carrigan, 2007; Hewlett & Bleich, 2004; Ponte, 2004). Considering the current and projected registered nursing shortage figures, factoring in the increasing aging population and preparing for greater shortages of qualified nursing faculty, significant efforts must be made to prevent a decline in the U.S. healthcare system that could jeopardize the health and well-being of all U.S. citizens and could potentially result in fatal consequences for at-risk populations, such as the aging Baby Boomers. Findings from this study may help to increase the retention of nursing students in a diploma nursing program, a program preparing graduates for licensure as registered nurses with a focus on the acute care hospital setting. This would thereby increase the available RN care givers within the community and subsequently create a positive impact on care within the metropolitan community.

Operational Definitions and Acronyms

AACN: American Association of Colleges of Nursing

ADN: Associate Degree, Nursing, may also be indicated as ASN, a two-year course of study in nursing

Admission Criteria: refers to the entire complement of requirements established and maintained by this diploma nursing program to serve as a basis for ranking and admissions decisions of the Admissions and Selections Committee. The admission criteria included: completion of eight specific college courses, representing 25 credit hours, with a grade of “C” or better in each course and an overall GPA for these courses of 2.7 or better. Chemistry and computer literacy are required at the high school, adult education or college level. NET® scores reflecting a composite percentile above the 50th percentile and critical thinking scores of 50% or higher on each component are necessary. Applicants
must complete all admissions forms and submit required documents, including a high school transcript prior to published deadlines.

**BSN:** Bachelor of Science in Nursing, a four-year course of study in nursing

**Completion Status:** describes the terminal outcome of an enrolled student’s experience in the diploma nursing program. Completion status is broadly described as graduated or did not graduate and specific qualifiers may be used to provide greater information regarding the circumstances related to either condition. For example, with graduated, the length of time required to complete the program will be indicated. In circumstances noted as did not graduate, the status or potential application for readmission may be noted to identify differential attrition factors.

**Critical Thinking Scales:** specific components include: main idea of passage, inferential reading and predicting outcomes. These components of critical thinking on the NET® are included to predict success in certain types of professions or instructional programs in which critical thinking is known to play an important role.

**Did Not Graduate, Did Not Reapply:** refers to students who withdrew or were dismissed for any reason and if eligible to reapply for enrollment, did not do so by the required readmission application deadline date.

**Did Not Graduate, Ineligible to Reapply:** refers to students who withdrew or were dismissed under circumstances that represented grounds for permanent dismissal; examples include, but are not limited to: subsequent course failure following previous readmission; progressive records of clinical unsatisfactory performance; or violation of policies associated with dismissal for cause.

**Did Not Graduate, Readmission Denied:** refers to students who submitted applications for readmission which were then denied by the Admissions and Selections Committee. Students are aware
that readmission is not automatic. The Committee reviews performance from all academic and clinical efforts by the student and considers both attitude and aptitude in supporting readmission decisions.

**Did Not Graduate, Second Course Failure:** refers to students who have previously been admitted and on the subsequent admission experience failure for a second time. The course failure may be in the original course being repeated or any more advanced course in the curriculum plan.

**Enrolled Students:** students who were accepted for conditional admission and met all requirements at the beginning of the semester or record, began the enrolled course and maintained enrollment for a minimum of two weeks.

**Grade Point Average (GPA):** the calculation of an average grade point based on college credit hours and a four-point quality point scale, in which A = 4, B = 3, C = 2, D = 1 and F = 0, for the 25 hours of required prerequisite college level general education courses. In the event of a repeated course, the higher of the first two grades is used as a basis for the calculation.

**Graduated, 24 Months:** represents a graduate that completed the curriculum without interruption and graduated with the original enrollment cohort. The 24-month designation refers to elapsed time from program entry to program completion.

**Graduated, 36 Months:** represents a graduate that completed the curriculum with one interruption in the program of study. Whether interruption is from withdrawal or failure, students must apply for readmission to re-enter in the course and semester in which they withdrew or dismissed. The student graduates with the cohort of students who entered the program one year later than the student’s original enrollment cohort.

**Graduated, 48 Months:** represents the maximum amount of time allowed for a graduate to complete the program of study and indicates two instances of interruption of study, one of which must be a
withdrawal for health or personal reasons. The student graduates with the cohort of students who enters the program two years later than the student’s original enrollment cohort.

**Graduates**: refers to enrolled students who successfully complete all academic, clinical and administrative requirements necessary to participate in graduation activities, be presented a school pin and receive the official program diploma.

**HRSA**: Health Resources and Services Administration

**Inferential Reading**: a component of reading comprehension which the NET® examines as the ability to scrutinize the “knowledge of the nature of valid inferences, abstractions and generalizations in which the weight or accuracy of different kinds of evidence are logically determined” (Frost, 2004, p. 32).

**IPEDS**: Integrated Post-Secondary Education Data Systems

**Main Idea of Passage**: a component of reading comprehension which the NET® examines as it involves the ability to clearly identify the topic of the passage presented and the information that supports the idea.

**Marital Status**: the students’ report of their marital status, as limited by the choices: single, married or divorced. The status is noted on demographic forms at the beginning of the semester.

**NCLEX-RN**: National Council Licensing Examination-Registered Nursing, a computer adaptive examination with designated passing requirements which serves as the licensing examination necessary to become a registered nurse

**NLN**: National League for Nursing

**Nurse Entrance Test (NET®)**: a standardized test measuring mathematics, reading comprehension and critical thinking components that has served as a useful tool for predicting academic potential in nursing programs.
Predicting Outcomes: a component of reading comprehension which the NET® examines as the ability to “select pertinent information for problem solution, formulate or select relevant and promising hypotheses” and predict outcomes (Frost, 2004, p. 32).

Predictive Grade Point Average (PGPA): a subset of the grade point average (GPA) that represents the calculation of an average grade point based on college credit hours and a four-point quality point scale, in which A = 4, B = 3, C = 2, D = 1 and F = 0, for program-determined college courses believed to assist in predicting success among potential applicants. The specific college courses include: English Composition, College Algebra, Human Physiology, Human Anatomy and a fifth required course in which the applicant has the highest letter grade. This calculated value may be used in ranking considerations among applicants by the Admissions and Selection Committee.

Program Length: the amount of time required by a student to complete the entire course of study. The program curriculum is designed to allow completion in a continuous manner over four semesters and one summer term. If a student experiences uninterrupted study in this manner, the program length is defined as 24 months. With interrupted study, variations to completion could be described as either 36 months or 48 months.

Regulatory Issues: the state board of nursing maintains legal jurisdiction over student nurses and provision for student nurse practice is included in the state practice act for registered nursing. All student nurses in the state must submit fingerprint cards and undergo background checks through the state police and the Federal Bureau of Investigation as part of their application to participate in clinical nursing courses. The board of nursing then grants or denies the student’s request. If regulatory issues are present, even if the student is in good academic standing, the student must withdraw from the nursing program until state board of nursing approval can be obtained.
CHAPTER 2

REVIEW OF RELATED LITERATURE

By providing a review of the related literature, this chapter serves to provide a basis for the developing and conducting this research study. Information will be provided relative to nursing workforce issues related to the supply and demand of nurses in today’s healthcare environment. Additional pressures exist secondary to the aging of the Baby Boomer generation and the impact this creates on the need for healthcare services, as well as the pending retirement of the nursing workforce. The critical need for a well-educated and capable nursing workforce, along with the pressures inherent in the nursing education system relative to student enrollment and student attrition lends further support to the significance of this study. Tinto’s Student Integration Model will be discussed as a basis for observation of factors affecting student persistence. As registered nursing is a practice discipline involving rapidly changing scenarios with a direct link to human lives, critical thinking will be discussed as a factor for consideration with the admission process and potentially in the retention process. Further, retention models will be used to provide a conceptual framework for discussing conditions which promote student retention secondary to social and academic integration.

A review of literature on the nursing shortage provided data from numerous sources which predict varying degrees of crisis over the next 10 to 20 years. While there is indeed cause for concern, it must also be noted that there may be overstatement of the problem in some areas. Nursing organizations have a wealth of data related to applicant numbers and enrollment statistics. However, when reporting number of applicants, number of qualified applicants and number of qualified applicants denied admission the data can only be collected on a school or program basis. Therefore, when numbers are aggregated for state or national pooled statistics, duplication is inevitable. At this
time, there is no concise method to establish an unduplicated count of the applicants or the denied admissions, as one applicant may have applied to multiple programs and while admitted to one, been turned away by another program.

Additionally, nursing supply and demand data is further clouded on the demand side by employer data. The inherent difficulty in this data collection method is in truly defining how demand is measured. If a hospital defines demand by current vacancy rate, number of RNs needed to staff to licensed bed capacity, RNs required to staff according to the budgeted staffing plan or even by the number of RNs they would hire within a specified time frame if the RNs were available could each produce different values at the agency level. This would therefore potentially create an inflated projection or an understated projected need.

Review of the literature relative to retention is found in many forms and related variations. It may be studied as retention, attrition, persistence or departure. Much of the literature addressed the retention dynamic in either the high school or college setting. When using the college setting, studies incorporated a variety of variables specific to demographics and the two-year or four-year format of the program studied. When GPA was a factor, the calculated value was either the high school cumulative GPA and its relationship to college persistence, or the cumulative college GPA and its relationship to college persistence. The diploma nursing program presents a variation from either of these scenarios. Within the diploma nursing program curriculum structure, potential students complete prerequisite general education courses in a separate college or university setting prior to application to the diploma program. Therefore, the GPA used within the diploma setting may represent a restricted value, as some courses a student has completed may be insignificant for consideration in the diploma program application process. Further, once accepted by the diploma program and enrolled in the
nursing courses, the student is generally required to earn a minimum grade of “C” in each nursing course; often within seven-point grading scales. This gap in the literature further supports the study of diploma nursing programs. The study can serve as a basis for further description of this student population and perhaps allow for comparison of factors that may influence retention of these valuable students. These students cannot be replaced in upper-level courses and their attrition therefore delays the ability to respond to the RN shortage in healthcare in an efficient and effective way.

**Nursing Workforce Issues**

**Nursing Shortage**

The American Association of Colleges of Nursing (AACN), in October 2007 published a Nursing Shortage Fact Sheet stating, “The United States is in the midst of a nursing shortage that is expected to intensify as baby boomers age and the need for health care grows. Compounding the problem is the fact that nursing colleges and universities across the country are struggling to expand enrollment levels to meet the rising demand for nursing care (p. 1).” This document also outlined shortage indicators based on workforce supply measures from statistics reported by the Health Resources and Services Administration (HRSA), the American Hospital Association (AHA) and the U.S. Bureau of Labor Statistics. According to projections from these groups, by the year 2020 the U.S. registered nurses (RNs) shortage will be between 340,000 and one million nurses. Hospitals nationwide currently report a RN vacancy rate of 8.5% and note an increasing difficulty in recruiting nurses to practice in hospitals (American Association of Colleges of Nursing, 2007). This range of projections represents the potential for crisis even at the lowest end of the projections.

Many studies, chiefly using survey instruments have been conducted to examine and described the current nursing workforce. Each reported similar findings, with slightly different percentages over
time, related to key characteristics. The most consistent measure is a nationwide sample survey of RNs conducted every four years by the Department of Health and Human Services (DHHS), Health Resources and Services Administration (HRSA), Bureau of Health Professions. National nursing bodies, as well as independent researchers, use these figures to support nursing supply and demand initiatives in the workplace, in education and in the legislative arena (Aiken, et al. 2002; American Nurses Association, 2006; Berlinger & Ginzberg, 2002; Carrigan, 2007; Donley, 2005; Hewlett & Bleich, 2004; Hinshaw, 2001; Nevidjon & Erickson, 2001).

Donley (2005) having reported on the demographics of the current workforce, expressed concern that the workforce was missing 20% of eligible practitioners, showed an erosion of the nursing workforce in hospitals to below 60%, and continued a trend toward an older workforce with an average RN’s age estimated at 45.2 years with an additional increase of approximately 3.5 years and eight years for nurse educators prepared at the master’s level and doctoral level, respectively. Donley believed projections presented to help enact the Nurse Reinvestment Act of 2002 presented an unbalanced portrait of the state of nursing practice today as one with a potential to present negativity about nursing that may persist for a long time. Noting that the historic and contemporary response to a nursing shortage is to get more nurses, Donley acknowledged that it may be impossible “to increase the number of people who enter nursing when the population is smaller and young people, especially young women of generations X and Y, have so many attractive career choices” (p. 313). Donley purported the need to examine and improve workplace culture to create an environment that is creative, supportive and stimulating. This must extend beyond the practice setting of the workplace to the educational setting of the nursing classroom. Donley stated, “Restoration of a health care delivery

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system that is grounded in humanistic values and centered on patients’ well-being is a contemporary challenge” (p.317).

Heinz (2004) noted that the shortage will reach an alarming level over the next 20 years as the greatest number of RNs reach retirement age and there are inadequate numbers for replacements. The impact of a shortage of that magnitude will contribute to adverse patient outcomes. As the Baby Boomers age, chronic conditions will become co-morbid factors with serious illnesses that will emerge in this patient population, the volume of patients created by this situation will be met by a reduced nursing workforce making it increasingly difficult to maintain the standard level of care.

Berlinger and Ginzberg (2002) further attributed the decrease in the number of nurses to the need for a two-year or four-year nursing degree, “coincident with the marked decline of the nursing diploma school” (p. 2742) as a factor that keeps potential applicants from entering nursing. They described importing international nurses to supplement the workforce and explore other factors related to wages, working conditions and job satisfaction.

**Nursing Faculty Shortage**

As a contributor to the nursing shortage, the growing shortage of nursing faculty must also be included. Increasing numbers of nursing faculty are approaching retirement age and fewer registered nurses are seeking education required to fill these faculty positions. White (2006) reported that many schools of nursing lack the capacity to increase enrollment because of faculty shortages and clinical site availability. The National League for Nursing’s chief executive officer, Dr. Ruth Corcoran, was quoted as saying “The number of qualified nurses available to teach future generations of RNs continues to decline. This year [2005], in a significant increase of 18%, schools of nursing were forced to reject more than 147,000 qualified applicants as record numbers of potential nurses await places in
America’s RN programs” (Klestzick, 2005, p. 1). Klestzick (2006) acknowledged that the yield rate of applicants who accept admission to school remains around 90%, allowing nursing school to continue to be selective in admissions criteria. However, Sayles, Shelton, and Powell (2003) noted that in 1997 there was a sharp decline in both RN licensing exam pass rates and nursing program graduation rates. The declining graduation rates from 82% to 69% “suggested intervention was necessary” (p. 116). This has been leading nursing programs over the past decade to evaluate the admissions process, as well as seek curricular and programmatic intervention and remediation strategies.

**Nursing School Admission Factors**

**Grade Point Average**

Research related to grade point average (GPA) also looked at personal characteristics related to student engagement/self-efficacy. Research by Hsieh, Sullivan, and Guerra (2007) examined self-efficacy and goal orientation as measures of student’s belief that they were capable of succeeding and the reason they attempted an academic task. It was noted that “Students with more confidence generally are more willing to persist in the face of adversity, and students with goals of “mastering a task” tend to invest in focused effort (p. 456). Study participants were undergraduate students from a metropolitan institution who completed two sets of questionnaires adapted from the Patterns of Adaptive Learning Survey (PALS) and the Achievement Goal Orientation Inventory. The study results reported a strong positive correlation between performance-approach and performance-avoidance goals \( r = .46, p < .01 \). Further, a hierarchical regression analysis was used to evaluate how well self-efficacy and goal orientations predicted students’ GPA. Self-efficacy alone was significantly related to GPA \( R^2=.13, \text{ adjusted } R^2=.12, F_{(1,94)} = 14.15, p < .001 \). Addition of goal orientation to the regression analysis resulted in an \( R^2 \) change of .23, \( F_{(3,91)} = 10.61, p < .001 \), with performance-avoidance goals and mastery goals representing the strongest predictors. Therefore, the study concluded that the more
students used mastery orientations, the higher the GPA. A comparison was made between successful and unsuccessful students, with a GPA of 2.0 or greater as the determinant of success for the independent variable and using self-efficacy as the dependent variable. Using ANOVA, it was determined that students’ self-efficacy judgments were significantly higher for the group with a GPA greater than 2.0, representing good academic standing ($M = 4.41, SD = .51$) than the group with less than a 2.0 GPA who were on academic probation ($M = 3.85, SD = .78$), $F_{(1, 99)} = 17.92, p < .001$.

Further analysis suggested that students in good academic standing had a stronger belief that they would be successful that those with a lower GPA.

Kah, Cruce, Shoup, Kinzie, and Gonyea (2008) merged student level data from the National Survey of Student Engagement (NSSE) for 18 colleges and universities to study links between academic achievement and persistence. To examine student engagement, the particular measures from the survey of time spent studying, time spent in co-curricular activities and a global measure of engagement in effective educational practices were used. Using ordinary least squares regression, the researchers determined models for first-year students of time-on-task and educationally purposeful activities on earned grade point average for the first academic year and persistence to the second year. A second model then incorporated time on task and global engagement with first-year grades with the first model variables to examine the effect on GPA and persistence. “Model 1 includes students’ demographic characteristics, pre-college experiences, and prior academic achievement as predictors of GPA; together they account for 29% of the variance in first-year grades” (Kah, et al. 2008, p. 546).

The study indicated that the strongest influence on first-year GPA was prior academic achievement. When student engagement measures were added in Model 2, an additional 13% of the variance in GPA for the first year was explained; thereby increasing the total variance explained to 42%.
study indicated that student engagement during the first year had a statistically significant effect on persistence, even when controlling for background characteristics and other individual qualities.

Bailey, Calcagno, Jenkins, Leinbach, and Kienzi (2006) examined a number of covariates to explain graduation rates in the community college setting. It was noted that GPA was an “important and positive predictor of institutional graduation rates” (p. 498). Other factors considered included standardized test scores, geographic size of the area surrounding the school, and demographic factors related to race, gender and age of the student body.

**Nurse Entrance Test (NET®)**

“Admission test scores are positively related to retention rates” noted Derby and Smith (2004, p. 765). For college and university admissions, standardized tests such as ACT or SAT are frequently used for admission decisions and course placement. As the diploma nursing program requires prerequisite general education courses at the college level prior to application, other standardized tests, such as the Nurse Entrance Test (NET®) may be utilized in the admission and selection process.

Use of entrance testing for program admission allows for objective comparison of applicants using a consistent measure and may promote selectivity through created rankings of applicants in the general pool. Titus (2004) when examining institutional context on student persistence found that selectivity bears a contextual effect on student persistence. Noting that it “reflects a positive increment to the chance of persistence that accrues to the student as a result of being at a more selective institution” (p. 692). Selectivity also indicates a measure of average academic ability of the student population; therefore the peer climate can positively influence student persistence.

As nursing education programs search for admission criteria that contribute to student success, the adoption of particular measures may then be adjusted based on actual retention or attrition rates noted within the program. Following changes in the admission criteria, follow-up program evaluation
should be conducted to measure the effect of the change and to evaluate the impact on student retention. In one such study, Ellis (2006) noted that following an increase in the required scores on the NET®, “evaluation revealed that using the Nurse Entrance Test as a tool for admissions screening, specifically the portions of the examination that predict critical thinking, was effective in helping to predict success through level I nursing courses” (p. 259).

Sayles, et al. (2003) conducted a correlational comparative study to determine whether critical thinking was a contributor to success of RN program graduates on successful completion of the NCLEX-RN licensing exam. Specifically, they were examining the total testing system from Educational Resources, Inc. which includes the NET® test as a measure of critical thinking through three subscales. In discussion of the data analysis, the researchers noted the NET® Composite percentage and percentile, along with reading comprehension and math skills as being significant at the p=.05 level or less.

Gallagher, Bomba, and Crane (2001) conducted a comparative study between the NET® and another academic achievement tool, the Entrance Examination for Schools of Nursing (RNEE), also known as the Registered Nursing Entrance Exam, to determine if program interventions relative to student NET® scores improved student success in the associate degree nursing program. For the study, students in a particular semester and year were randomly assigned to one of 12 nursing sections, which were grouped into three groups of four sections each. All students progressed through four learning modules; completing the first one together but experiencing the remaining modules in different sequences. Data analysis of the NET® academic subtests showed no significant difference between student success and failure. The authors reported that non-successful students had a mean mathematics score that was significantly higher than the successful students (p < 0.05). However, no other NET® components could be linked to student success.
Critical Thinking

Nursing students have demonstrated a difficulty in transitioning from the academic, or classroom setting, to the practice, or clinical setting. In developing strategies to reduce this chasm, educators have examined critical thinking skills as a key component. Gassner, Wotton, Clare, Hofmeyer, and Buckman (1999) conducted a qualitative study using questionnaires and interviews to explore the collaboration that takes place between the instructor and student in this reality-based learning environment. Critical thinking skills play an important role in student development at this juncture.

“Nursing requires individuals to process complex data in the context of an increasingly complex health care system while planning, managing, and evaluating patient care” (Stone, Davidson, Evans, & Hansen, 2001, p. 65). The author’s further noted that critical thinking is a required criterion for accreditation and programs must document how it is measured and how outcome data are used in program evaluation. It was further supported in the literature that instructional strategies must be utilized to help students develop critical thinking as they develop self-directed learning patterns (Arpanantikul, Thanooruk, & Chanpuelksa, 2006).

Phillips and Bond (2004) noted that although there is research on critical thinking, little focuses on the student’s experience with critical thinking. The authors noted the conceptions of critical thinking to include views wherein it is a generic skill, an embedded skill, a component of the skills of the autonomous learner and for critical being. Using qualitative methods that included a phenomenological approach, these authors conducted a study of undergraduate students in a management course and described four dimensions of variation in the student’s experiences of critical reflection. The dimensions included: a) Weighing up pros and cons, using prescribed processes, b) Looking at the situation from all angles using prescribed processes, c) Looking back on the situation
and critically appraising it, and d) Looking beyond what is there, looking behind the façade. They further concluded that solely embedding skills in a curriculum will not result in desired learner criticality. Criticality at this level requires organizational shift, primarily in organizational culture.

Faccione (2007) described critical thinking in terms of core intellectual skills. These skills include interpretation, analysis, evaluation, inference, explanation, and self-regulation. Using a Delphi method with a panel of experts, Faccione’s group established these component skills of critical thinking. Recognizing that critical thinking relates to the questions and approach someone takes toward problems or issues, the group also explored the disposition one might have toward critical thinking. Characteristics describing a critical thinking disposition were proposed to include such factors as: inquisition, systematic, judicious, truth seeking, and analytical, open-minded, and confident reasoning. This work led to the development of the instruments designed to measure critical thinking, the California Critical Thinking Skills Test (CCTST) family of tests. Further, this group developed the California Critical Thinking Disposition Inventory (CCTDI) to assess the factors related to disposition toward critical thinking (Faccione, Faccione, & Giancarlo, 2000).

Irani, Rudd, Gallo, Ricketts, Friedel and Rhoades, reported that in 2002, separate research, using factor analysis on data from more than 800 test subjects, failed to support the constructs Faccione had identified. These researchers at the University of Florida systematically reviewed the original Delphi study and factor analysis from the CCTDI, along with a current review of the literature in order to develop and pilot another instrument for assessing critical thinking disposition. The new instrument focused on three specific construct areas, Engagement, Cognitive Maturity and Innovativeness (EMI). They further developed quantitative (UF/CTS) and qualitative (UF/QCTS) critical thinking skills instruments. The quantitative instrument measures the constructs of analysis, inference, and evaluation.
The qualitative instrument measures the constructs of interpretation, analysis, evaluation, inference, explanation and self-regulation.

Combining aspects of critical thinking with mathematics, reading comprehension and student learning traits, Educational Resources, Incorporated developed the Nurse Entrance Test (NET®) to assist nursing programs in evaluation of applicants or newly admitted students (Frost, 2004). Previously, schools had only the American College Testing (ACT) scores as a standardized assessment of these candidates or students. This instrument provided nursing admissions committees with a standardized measure that used nationally normed data to report scores for critical thinking in three subscales: inferential reading, main idea of passage and predicting outcomes. This added an additional perspective for assessing potential nursing candidates.

**Student Demographics Related to Retention**

**Age and Family Responsibility**

Goldfinch and Hughes (2007) noted that the retention rates and withdrawal factors are multifaceted, but studies by different institutions reported opposing results as to the effect of age. In a retrospective study of student data in the community college setting, Fike and Fike (2008) reported the bivariate correlation of student age with retention was negative, and the positive correlation in the multivariate model was of small magnitude (CI_{95} = 1.005, 1.018) making it a weak predictor of retention in this model” (p. 78).

Bailey, et al. (2006) described factors related to student retention based on academic and demographic characteristics. When describing the relationship between age as a demographic factor related to student retention, it was noted that lower institutional graduation rates are associated with a student body with a higher average age. This finding mirrored reported related literature of findings
from similar studies which also used IPEDS data and noted that institutions with older students had lower graduation rates.

Colleges and universities continue to seek a student body that is representative of diverse cultural, racial and educational backgrounds. Nursing program admissions mirror this trend. Therefore, within nursing programs, there may also be an increase in nontraditional nursing students and an under representation of minority students. The life of the nontraditional student in a nursing curriculum today can be increasingly complex and may create role strain related to family responsibilities, work responsibilities and academic/clinical responsibilities.

Glogowska, Young, and Lockyer (2007) in a qualitative study of factors associated with persistence or withdrawal by students captured six separate categories of factors that were significant in pushing the student toward the decision to withdraw from a program. Among these categories, two were related to outside responsibilities; the burden of other demands and lack of support. It was further described that demands of a course, coupled with outside responsibilities to employment and family resulted in student exhaustion, chronic fatigue and lack of personal time. If unexpected demands arose due to health, family problems or similar factors, the subsequent pressure could become intolerable and result in withdrawal by the student. Lack of support was described by students related to both formal and informal sources. Family, friends and peer group, in this study represented by other nursing students, represented informal support mechanisms. Formal support was perceived as associated with the institutional structure in the form of faculty or tutors. Formal and informal support represented factors that could either push the student toward withdrawal or pull the student toward continuing enrollment. The influencing factor was related to the degree to which formal and informal support was perceived to be available to the student. Students described being able to rally support around a student considering departure to help them reconsider and remain enrolled. Descriptions were also
given of support from tutors helping the student overcome personal learning challenges, increasing organizational skills or facilitating student understanding that they were not alone or unique in their struggle.

**Gender**

Baker, Caison, and Meade (2007) noted that studies have reported gender differences related to student departure from college. For women, the quality of interactions with their peer group was more strongly predictive of decisions to withdraw. Whereas with men, the departure decision was better predicted based on the level of institutional and goal commitment. In a study of freshmen at a large, land grant university, these researchers further examined the Institutional Integration Scale (IIS) to determine the predictive validity of the instruments subscales related to gender-related differential college student attrition. Results of their study indicated that the subscales of the instrument could not predict or explain attrition by gender.

Bailey, et al. (2006) utilized data from the Integrated Postsecondary Education Data System (IPEDS) to examine relationships between factors associated with graduation rates. The available information is generally known as Student-Right-to-Know (SRK) data. Concern has been raised regarding use of graduation rates reported with this data because the raw data contains no adjustment for students who enroll in courses, but are not on a degree-seeking track; factors such as work responsibility or poor academic preparation that are beyond the control of the college and student’s ability to change enrollment between colleges which may represent a successful transfer rather than a dropout. Bailey et al. described the highest graduation rates at private universities, attributing the graduation rate in part to selectivity and matching of students to the particular institution. Using logistic regression on IPEDS data, they also reported that among other factors, private colleges with a higher proportion of women had higher graduation rates.
Derby and Smith (2004) reported retention variables that have been identified as “strong predictors of retention” at the community college and university level. Gender was included among these predictor variables. Further noting, “Women seem to have higher retention rates when considering those students who complete their degrees within four years” (p. 765). Although further noting that retention rates for men rise when considering persistence beyond four years for degree completion.

**Cultural Diversity**

Current literature noted that the past two decades have shown a change in enrollment at academic institutions from “the traditional white male to the non-traditional minority female” (Lau, 2003, p. 130). The demographic shift is attributed to legislation related to rehabilitation and disabilities. As minority enrollment at two-year and four-year institutions increases, it is estimated that minority students may represent more than one-third of college attendance.

Titus (2004) in an examination of characteristics influencing student outcomes looked at both institutional and individual characteristics. Included was the Berger and Milem model which described institutional influences related to size, type, selectivity and location, as well as individual influences related to gender, ethnicity and socioeconomic status (SES). This model, reported Titus, suggests that the background characteristics described, along with peer characteristics directly influence student persistence. Further, Titus described findings that “persistence among racial/ethnic minority and white students is positively related to a diverse campus” (p. 582). Titus conducted a study of student-level variables related to persistence, using student-level data from the U.S. Department of Education’s National Center for Education Statistics (NCES) to address “What student characteristics, experiences, attitudes and environment pull variables influence student persistence within a four-year college or
university?” (p. 679). The sample analyzed indicated that “racial/ethnic diversity as an institutional-level variable was unrelated to college student persistence within a four-year institution” (p. 690).

Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008) described the historically lower completion rates for underserved students and cited a 46% completion rate for African-American students and Latinos at the six-year mark. They further noted that “Race and ethnicity along with family income are especially important because the nature of the undergraduate experience of historically underserved students can differ markedly from that of majority White students in predominantly white institutions” (p. 542). In their study, they examined the interaction between engagement in educationally purposeful activities and race to determine if this resulted in an impact on GPA for the first year by race or ethnicity. It was determined that a direct effect of educationally purposeful activities was present that differed by race and ethnicity, but only for Hispanic and White students. “A one standard deviation increase in student involvement in educationally purposeful activities resulted in about .11 advantage in first-year GPA for Hispanic students compared with only .03 benefit for White students” (Kuh, et al. 2008, p. 550).

When researching NCLEX-RN pass rates as a predictor of success, Sayles, et. al (2007) in a correlational study, reported that “one demographic variable achieving statistical significance was ethnicity. Minority students were less likely than their white counterparts to pass the NCLEX-RN (r=.263, p=.03)” (p. 119).

**Retention and Attrition**

Student retention and attrition has been a subject of research for many years. Following the emergence of Tinto’s model emphasizing the critical influence of social and academic integration on the student’s decision to continue in a college program, Pascarella and Terenzini (1979) conducted a now classic study to determine the main and interaction effects of student characteristics and measures
of social and academic integration of freshmen students’ decisions related to withdrawal from college. “After controlling for the influence of twelve student entering characteristics, thirteen measures of social and academic integration contributed significant $R^2_c$ increases in the explanation of voluntary withdrawal from college” (p. 197). The study further documented the most consistent interaction effect involved the frequency and quality of student-faculty relationships.

The greatest amount of research noted in the literature was conducted in four-year institutions. Traditionally, the student population of these institutions of higher learning has been predominantly white, residential and traditional with respect to age (Chaves, 2006). With the growth of the community college system nationwide, there is greater interest in potential differences that may exist with the student population in this setting and influencing factors relating to retention of these students. A diploma nursing program creates a different challenge, in that studies were not found related to student retention characteristics. Minimal published research existed on this preparation program for entry into nursing practice. Studies reported about associate and baccalaureate nursing programs generally addressed success on NCLEX-RN licensing exam or a teaching methodology. With respect to retention, studies in four-year settings focused on the factors influencing the first year of enrollment. In a diploma nursing program, applicants who are selected have already completed the equivalent of one year of college level work. This is the result of having completed a minimum of 25 hours of specified general education courses. Review of available retention literature from two-year and four-year programs allows for building a general knowledge base around this subject.

Within the current literature, the term retention was sometimes presented with a negative connotation. Tanner and Galis proposed that “Lack of student achievement is the basis for most of the retention arguments” (Tanner & Galis, 1997, p. 107). The controversy related to the term retention is triggered by the dual use of it to mean maintaining academically weak students within an educational
system and allowing them to progress with their cohort despite deficiencies in skills or knowledge. Even with that understanding of the term, there were proponents for and against the term student retention.

Beyond the confusion of varied term use, retention is the counterpart to the related term of attrition. Student demographic characteristics such as age, race and gender have historically been examined and described with respect to attrition (Ishitani, 2006). Other researchers examined the influences related to availability, cost and accumulated debt (Cofer & Somers, 2001). These authors began with the Morrill Land-Grant Act of 1862 and followed legislative and financial funding to show continued and current financial impact and program availability. Their major finding related to the availability of financial aid, chiefly in the form of student loans and the negative impact that this accumulated indebtedness will have on student persistence in the college setting.

Other researchers examined retention, or persistence in terms of academic preparedness and time on task as variables related to student success (Bagayoko & Kelley, 1997). These authors sought to apply the power law of performance to the models as a mechanism to strengthen each model by increasing a student’s time on task. Therefore, as time on task increases, the student’s confidence with performance becomes stronger and the likelihood of continued engagement and persistence increases.

Houston and Anthony (2003) conducted a study of the study habits of science students. They also looked at how the students manage the transition to academic life in terms of student engagement and attachment to the university, as well as the student’s ability to successfully manage personal problems. Induction into the program is an identified key factor related to subsequent retention. This process needs to be concentrated and systematic to foster early recognition of academic study needs at the beginning and more advanced level of the program. Other studies supported a rigorous orientation
program or other means of structured induction as an effective contributor to student retention (Derby & Smith, 2004; Maggio, White, Molstad, & Kher, 2005; Maguire, 2001; Raymondo, 2003).

Many research studies examined retention from a multifaceted approach which represented some aspect of the relationship between academic, socioeconomic and/or motivational or engagement variables on the student’s persistence or success. Studies were primarily conducted in community colleges or four-year universities, few of these with the study of nursing as a primary focus. The current literature lacks research studies related specifically to retention or attrition in the diploma nursing program setting. Therefore, the further literature review will focus on retention models, demographic variables and academic indicators.

Glogowska, et al. (2007) noted the complexity of the decision-making process a student undergoes to determine whether to withdraw or continue with university enrollment. In an effort to examine and understand attrition and therefore improve retention, the researchers conducted a qualitative study via semi-structured interviews to explore student views. Using a questionnaire with the entire cohort of a second year nursing course, 30 students who faced departure but chose to continue were willing to be interviewed about their dilemma related to leaving the program or continuing. Relative to students who chose to withdraw, the researchers selected students who chose to withdraw from adult nursing courses during a two-year period, 81 students were selected, of which 19 completed the interviews. Transcribed interviews were coded to describe all emergent themes and issues. Coding, charting and descriptive accounts were performed by the first author, with the second author checking plausibility and credibility of the interpretations. The results reported were categorized as “push” factors that drive students to withdraw and “pull” factors that result in increased retention of student in courses. Push factors influencing the decision making to withdraw included: “challenges of academic work, burden of other demands, financial strain, and lack of support, negative early
experiences and illness/injury” (Glogowska, et al. 2007, p. 67). Pull factors influencing retention included: “determination/stubbornness, commitment to chosen profession, informal support and formal support” (Glogowska et al. p. 71). The authors noted that the factors identified may have been the same for each group of respondents, as circumstances bearable for one student may be intolerable for another student. Therefore, the difference between the groups was noted to be the extent to which a student could resolve difficulties encountered. Further, the results indicated that institutional factors impact retention and while retention models work to assimilate the student into the institution, the institution may not be adapting to diverse student needs. Diversity may exist in living arrangements, employment requirements and family and other commitments. Any or all of these factors may increase individual student burden and ultimately lead to a decision to discontinue enrollment.

Retention of students may be viewed as an outcome of student development, as student development is the greater goal within a learning community. Educational programs promote intellectual and social growth of students. Therefore, student departure prior to educational program completion may be viewed in terms of individual characteristics, as well as individual-institutional interaction. Thus, individual programs and institutions should consider their role in decreasing voluntary withdrawal by students.

Student retention is a frequently used component for measuring institutional effectiveness. Many authors have sought to identify and define predictors that will predict student success and therefore, retention to degree, or program completion. Elements generally studied relate to demographics, as well as psychosocial predictors (Deberard, Spielmans, & Julka, 2004). This study used social support and coping as the psychosocial predictors; however, while they were able to predict academic achievement, but not college retention.
Murtaugh, Burns, and Schuster (1999) conducted a study of five years of students at a college in the northwest U.S. and found that attrition rates increased with age, possibly related to course scheduling at times that did not facilitate these students attendance. Decreased attrition was noted where there were higher high school GPA and first-quarter GPA. Students who attended and orientation course also had a reduced risk for attrition.

In a study in Scotland, Christie, Munro, and Fisher (2004) had similar findings when they determined students who left the learning committee had limited support networks and a perceived lack of fit with the institution. This led to a need for greater understanding of the types of programs that may focus specifically on supporting these at-risk students. Ashby (2004) also noted similar issues with student retention and noted findings to support student-related improvements, as well as faculty and institution based approaches to promoting retention of students.

Hermanowicz (2004) sought to research the specific subset of attrition that relates to selective institutions. Noting that attrition in any form is counter to the individual and institutional expectations, selective schools view attrition as more unexpected. This response is related to the efforts of selective schools to create admission components designed to establish a more specific match between the individual and the institution. Hermanowicz designed an exploratory qualitative study using semi-structured interviews to focus on a student-centered view of attrition. The interviews were conducted with 30 students who withdrew and represented just under a 25% sample of the students who withdrew during the three-year time span studied. The interviews were halted by the researcher at 30 students based on attainment of the saturation point for emergent themes. The researcher questioned students about the departure decision as it related to the particular institutional roles of faculty, academic advisers and staff in the residential system. Most of students who withdrew never discussed their decision to leave with faculty members. Those who spoke to faculty members did not find counsel,
citing the relationship for meaningful discussion did not exist with this individual. If they did not speak to faculty members, they generally cited that they viewed them as unapproachable about such matters. With respect to academic advisers, most who withdrew met with these individuals once or twice, usually for completion of paperwork. As the contact occurred after the decision was made, the student would be unresponsive to intervention and dialog at this juncture. As all but one of the study participants lived in residential housing, the role of the residential staff was included in this study of the students’ point of view. About half of the participants reported speaking with their residential adviser, but again it was post-decision and was viewed as a formality to inform them that they would be vacating the dorm. Conclusions of the study reflected the researcher’s description of the institution’s stance on departure as permissive and lacking of counsel at decision points that could potentially provide students with more of a basis for decision making. This broader perspective for decision making could thereby potentially result in more decisions to stay than to leave.

**Retention Models**

Interestingly, McLaughlin, Brozovsky, and McLaughlin (1998) addressed student retention based on Kubler-Ross’ stages of grief. The authors discussed changing attitudes by using these stages as they related to perceived undesirable change. Therefore, they desired to have the university view issues surrounding student retention to circumstances surrounding losing an old friend. Using this analogy, they offered mechanisms to address student retention within each of the five stages.

Bagayoko and Kelley (1997) described six basic categories of retention models. They are primarily prematriculation models based on student characteristics. Examples included congruency models between student motivations, aspirations and university environment. They noted the most widely used models to be longitudinal-process models and subsequently reviewed Tinto’s Student Integration Model (SIM) and Bean’s Student Attrition Model (SAM). Constructs related to these
models relate to parental approval, opportunity, financial aspects, goals and interest in persistence, among others. Tinto’s work, identifying the relationship between student integration to the university and persistence, along with Astin’s study of involvement, rather than integration were also reviewed by Wild and Ebbers (2002). Tinto’s work was the most referenced related to retention of students. One study presented the application of Tinto’s model in another culture in New Guinea (Mannan, 2007).

**Tinto’s Longitudinal Model of Individual Departure**

Tinto (1993) noted the problem of retention and attrition to be significant, citing the American College Testing (ACT) program data which reports 26.8% to 44% attrition from four-year and two-year institutions. First-year students leaving college represented the largest single portion of college departure. Individual departure was attributed to individual factors, interactional factors, the role of community, finances and general involvement and learning. Building community is an important part of the retention effort and must represent a multidisciplinary approach Tinto (1993). Tinto presented a longitudinal model of institutional departure that examines points along an educational continuum from pre-entry attributes, goals and commitments, institutional experiences, integration, goals and commitments and outcomes. The model integrated the academic system, as well as the social system and considered the external community, as well as the institutional community. Within each system, formal and informal influences were considered. Tinto noted the importance of considering point of view and creates opportunities to critically examine the university with respect to campus life and the university perspective (Tinto, 2000). Fike and Fike (2008) referenced the student development theory within Tinto’s model. In the context of Tinto’s model student’s progress through stages that are influenced by both academic and social integration in their development from being a novice first-time-in-college student toward being a mature student. Therefore, the student’s ability to integrate both social and academic components will impact the decision to continue college enrollment.
Chaves (2006) in discussing Tinto’s Interactionalist Theory noted the importance of recognition that students arrive with a personal level of commitment to their academic goals. The level of commitment is heightened or diminished in response to integration with the program, both academically and socially. Citing that the individual commitment response is impacted at the college, program and classroom level, Chaves echoed Tinto’s belief that student persistence “hinges on the construction of educational communities…which integrate students into the ongoing social and intellectual life of the institution” at each of these levels (p. 142).

**Conceptual Framework**

With respect to understanding the retention of nursing students in a diploma nursing program, consideration must be given to all identified factors which may be impacting positively the retention rates of adult learners. Additionally, consideration must be given to concepts which may represent detractors to student success and therefore contribute to student attrition. Development of the conceptual framework requires knowledge, theory and research to describe the important concepts within the model, as well as the known relationships between them. In order to develop a conceptual framework for nursing student retention, existing conceptual frameworks related to retention were reviewed. All models reviewed approached retention of students from a multifaceted perspective. While there were some similarities in components, the relationships between specific variables were not always as relevant to the diploma nursing program. For example, many education retention models are built on campus-based traditional students and the diploma nursing program is a commuter campus with a greater number of non-traditional students. Further, some models may be geared toward program lengths of four years. Retention models may include electronic or web-based learning and the diploma program does not utilize distance education (Berge & Huang, 2004).
Following review of the retention models noted, it was determined that concepts were similar in description, though sometimes with differing terminology. Berge and Huang (2004) presented a conceptual framework in which variables were clustered as personal, institutional or circumstantial. Personal variables contained subsets describing demographic variables (age, gender, ethnicity, residence, family income, socioeconomic status, and parent’s educational level/expectation), individual variables (academic skills and abilities, motivation, goals, commitment) and prior educational experiences (GPA, prior educational experiences). Institutional variables were used to denote bureaucratic variables (mission, policy, budgeting, funding, institutional awareness and participation), academic variables (structural and normative systems) and social variables (social system, mechanisms for social integration). Circumstantial variables that described and subdivided interactions that may occur, specifically institutional interactions (bureaucratic, academic, social) and interactions external to the institution (circumstances associated with life, work, family, socioeconomic status).
CHAPTER 3

METHODOLOGY

Population and Sample

This quantitative, retrospective study assessed variables of student retention for nursing students enrolled in a diploma nursing program. The target population was defined as the graduates of a diploma program located within the southern United States from 1985 through the graduating class of 2009. The accessible population consisted of students enrolling January 1998 and January 2008. The 11-year sample selected reflected the group of students for whom critical thinking scores were collected using the Nurse Entrance Test (NET®) developed by Educational Resources, Incorporated. Additionally, the scores for these students for reading comprehension were reported in subscales of inferential reading, main idea of passage and predicting outcomes.

The admission records for the diploma program were utilized to establish the total number of students enrolled in the program during the time frame studied. Once the complete frame of 470 subjects was identified, each subject record was assigned an identifier for the purpose of collecting the specific data related to the variables of the study. The program director examined all records for completeness to reduce the potential for missing data.

Ethical Considerations and Study Approval

Using established research protocol, prior to implementation of this study; appropriate forms were submitted to the Louisiana State University Institutional Review Board. An Application for Exemption from Institutional Oversight was filed, requesting the exemption based on the study’s use of anonymous secondary data. The project, therefore; did not present physical, psychological, social or legal risks to participants and did not involve any protected health information. The research
represented a study involving evaluation of normal educational practices using research data that could not be traced back to an individual study participant. This protected the confidentiality of study participants. The request for exemption was granted by the Louisiana State University Institutional Review Board as IRB# E4877 (Appendix A).

**Study Design**

Based on a review of the literature, independent variables were selected for study of retention and success of nursing students within a diploma nursing program. An ex post facto research design was utilized to examine and describe the relationships among the independent and dependent variables in the longitudinal data available for the identified eleven-year period of class cohorts. The time frame for the study was selected based on consistency in admissions requirements and availability of data. Cohort groups were created based on year entering the program. Within the cohort groups, subsets for study included graduates, Completers, and Non-completers. The subset of Completers was further subdivided based on uninterrupted study or interrupted study. The subset of Non-completers was further subdivided based on failure after readmission or absence of readmission. Each subset was analyzed relative to demographic and academic characteristics.

**Instrumentation and Data Collection**

Data collection for this ex post facto study was done in conjunction with the selected diploma program. Participant data was collected from secondary data. A unique identifier was given to each record in the complete data set to ensure an unduplicated count and to provide an opportunity for retrieval of any missing data. The secondary data identified subjects by the enrollment cohort and graduation cohort, but not by the participant.
The data set included demographic factors including: student’s age in years at enrollment; race as indicated by the student according to categories consistent with the Integrated Post-Secondary Educational Data System (IPEDS); gender; marital status at enrollment limited to categories provided; marital status at graduation limited to categories provided; and number of children. Academic factors included in the data set were: NET® scores for Reading Comprehension in the form of subscale percentages for inferential reading, main idea of passage and predicting outcomes; NET® composite percentile reflecting the national norm for a diploma nursing program; calculated grade point average (GPA) for required prerequisite general education courses; calculated grade point average for diploma program predictive prerequisite general education courses (PGPA); program completion status; and academic level and enrolled courses at time of program withdrawal or dismissal along with reason for withdrawal or dismissal.

The NET® was developed by Educational Resources, Incorporated. The passages on the reading subtest are graded on a 10th grade level according to the Gunning-Fog Index. The majority of the questions (82%) are written on a literal level and the remaining 18% tests inferential reasoning. The NET® instrument was standardized by equating the individual Composite Percentile, Math and Reading Comprehension scores with the ACT Composite scores. To evaluate instrument reliability, a correlation study was performed using the anchor test (NET®) and the target test (ACT) with a coefficient range from +.81 for math to +.98 for reading comprehension. Validity was examined using subtests for content validity, criterion-related validity and diagnostic validity. Content validity was established through design specifications and test items were only included if they emphasized skill focus and learning style behaviors of nurses based on the guidelines developed by the Examination Committee. Criterion-related validity was examined by determining the relationship between the
NET® Composite Score and the ACT Composite Scores. These values had overall ranges from +.79 to +.83, indicating a substantial relationship between NET® and ACT performance. Diagnostic validity sought to answer whether the NET® could identify students expected to have deficiencies in areas associated with the subtests. To test this, the NET® was administered to graduating nurses and a t-test was used to compare the graduating students’ performance to the norm for each subscale. The resulting t-values and levels of significance demonstrated that graduating students performed significantly higher than the average for entering students (Frost, 2004).

To collect the data, an Excel® spreadsheet was developed with a column for each data element associated with the study variables. An example of the spreadsheet is included in Appendix B. Using the complete frame of subjects, a unique identifier, or ID#, was created by using year of entry and the number of students admitted for that year to follow the pattern 98-1 through 98-45, 99-1 through 99-44 and so on for each of the cohort years included in the study. Participant data was then entered according to the data element indicated by each column. To collect the data, student records were reviewed in either electronic or paper format. In the event that a data element was not located in a particular file, school administrators were contacted to review the record for data collection oversight or to retrieve the information from another school data source and subsequently update the record. Records could not be removed from the file storage area.

Following collection of the data, additional columns were added to the spreadsheet to perform calculations necessary for formatting of data elements needed for the study. An example of this is the collection of date of birth and subsequent calculation of age based on a formula utilizing the date of program entry. Calculation based on the raw data allowed for appropriate entry of the data into the statistical software for data analysis. Data coding was performed based on establishing a numerical
value for the entry options associated with a particular item. The variable Gender was therefore coded as 1 = Female and 2 = Male.

After all data were entered into the spreadsheet, data quality and reliability were checked through a series of procedures. These procedures involved spot-checking a random sample of 50 records, representing 10.6% of the entire data set, to ensure correct data entry and correct data coding. All records within this sample were found to be correctly entered and coded. Using the functionality within the spreadsheet, data was systematically sorted using multiple combinations of sort keys to search the data for erroneous values based on expected ranges of values in each categories. Following this sort procedure, several GPA values were noted to fall below the expected minimum of 2.7 required for program admission. Each GPA value was verified and determined to be an accurate reflection of the student record. Similarly, components of the NET® scores were noted to fall below the required value of 50 for each component. The variances in these values were the result of a change in admissions criteria by the diploma program effective with the class entering in 2005. Prior to 2005, applicants were required to have a minimum composite percentile of 50 and an average of 50% for the combined critical thinking scales. In 2004, the admissions requirements were changed such that applicants were required to score at least 50% on each of the three critical thinking scales. All values below 50 were verified for accuracy. Upon completion of data screening for quality and accuracy, the data set from the spreadsheet was imported into the Statistical Package for the Social Sciences (SPSS®) version 17 for further data analysis.

**Data Summary and Analysis**

Using the SPSS software and procedures, data collected in the study were statistically analyzed and reported for each objective as follows:
Objective 1

Being descriptive in nature, objective 1 was analyzed using descriptive statistical techniques. The graduates of the diploma nursing school represented students who had completed the program and were represented by groups with completion times at 24, 36 and 48 months. Additionally, there were eight students who remain enrolled and are on track to graduation in December 2010. The graduates were described on the demographic variables of: age, race, gender, marital status at enrollment, marital status at graduation, number of children and completion status relative to program length. These variables were analyzed and described using frequencies and percentages. Additionally, means and standard deviations were calculated and included for the interval data associated with age.

Objective 2

Objective 2 continued the description of the diploma program graduates by analyzing selecting program admission requirements. These admission criteria were analyzed using descriptive statistical techniques. The program admission criteria studied included: Nurse Entrance Test (NET®) composite percentile; NET® critical thinking scales of main idea of passage, inferential reading and predicting outcomes; calculated GPA for required college general education courses; and calculated program predictive GPA for program-determined predictive courses within the general education requirements. Means and standard deviations were calculated and reported for each component.

Objective 3

The purpose of Objective 3 was to describe the students who were Non-completers of the diploma nursing program, regardless of the reason for their attrition, based on admission criteria and academic characteristics. As this objective is descriptive in nature, analyses consisted of means and standard deviations for the components utilized, including: Nurse Entrance Test (NET®) composite percentile;
NET® critical thinking scales of main idea of passage, inferential reading and predicting outcomes; calculated GPA for required college general education courses; and calculated program predictive GPA for program-determined predictive courses within the general education requirements. Further, frequencies and percentages were used to describe the amount of the program completed, the enrolled course at the time of departure and the reason associated with the attrition.

Objective 4

Objective 4 called for comparative analyses between the program Completers and the Non-completers based on selected admission criteria which included Nurse Entrance Test (NET®) composite percentile; NET® critical thinking scales of main idea of passage, inferential reading and predicting outcomes; calculated GPA for required college general education courses; and calculated program predictive GPA for program-determined predictive courses within the general education requirements. To perform these comparisons a t-test was utilized to compare the means of the two groups: Completers and Non-completers. “The t-test assesses the statistical significance of the difference between the two independent sample means for a single dependent variable” Hair, Black, Babin, Anderson, and Tatham (2006, p. 388).

Objective 5

Also comparative in nature, Objective 5 seeks to compare the two groups who experienced interrupted study to determine if differences exist between those who returned and were successful program Completers and those who returned and experienced a second failure or withdrawal. For comparative purposes, the t-test will again be utilized to compare the group means on the admission criteria of Nurse Entrance Test (NET®) composite percentile; NET® critical thinking scales of main idea of passage, inferential reading and predicting outcomes; calculated GPA for required college general
education courses; and calculated program predictive GPA for program-determined predictive courses within the general education requirements.
CHAPTER 4

RESULTS

This study was designed to describe the characteristics of nursing students enrolled in a diploma program in the southern United States between January 1998 and January 2008. The students’ demographic and academic characteristics, as well as their graduation or attrition status and the time frame for completion were studied. Comparisons were made between Completers and Non-completers and between students with an interrupted course of study with respect to their subsequent completion of the diploma program.

Completion status for a student enrolled in the diploma nursing program was broadly indicated as either graduated, graduation pending or did not graduate. In these terms, the diploma program retention for the 11-year period studied was represented by a graduation rate of 70.2% \( (n = 330) \) with the inclusion of the eight students currently enrolled in the program who anticipate graduation during 2010.

Attrition was represented by students who did not graduate \( (n = 140, 29.8\%) \). To more closely examine the completion status of these students, the categories were further delineated as ineligible to reapply, did not reapply, readmission denied and second academic or clinical failure. This analysis revealed that 67% \( (n = 94) \) of those 140 students who did not complete the program were not considered for readmission. Of the 94 students who did not receive consideration for readmission, 56.4% \( (n = 53) \) did not apply for program readmission and 43.6% \( (n = 41) \) were ineligible to apply for readmission. Of the 110 students considered for readmission, the denial rate was 4.5% \( (n = 5) \). Of the students who were readmitted \( (n = 105) \), the there was a 61% retention rate \( (n = 64) \) and an attrition rate of 39% \( (n = 41) \) representing those students who failed to graduate following a second clinical or academic failure.
If students did not apply for readmission \((n = 64)\), the reasons associated with the student’s lack of reapplication were noted. These reasons were grouped into the broad categories. The reasons in descending order of frequency were determined to be changed career \((n = 21, 32.8\%)\), financial reasons \((n = 20, 31.3\%)\), personal/family issues \((n = 13, 20.3\%)\), changed programs \((n = 6, 9.4\%)\), regulatory issues \((n = 3, 4.7\%)\) and relocation \((n = 1, 1.5\%)\).

**Objective 1**

Objective one was to describe students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 and graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) on selected demographic characteristics:

1. Age
2. Race
3. Gender
4. Marital status at enrollment
5. Marital status at completion
6. Number of children
7. Completion status relative to program length

**Age**

The age of the student was measured in years at time of enrollment in January of the designated year. The student’s age was calculated based using date of birth and program start date, each with the month, date and year format. Student age ranged from 20 years to 51 years. Table 1 reports the age of students at the time of program entry. The mean age was 28.0 years \((n = 330, SD = 6.2)\). The distribution of the age data demonstrated that 70% of students \((n = 231)\) were 30 years of age or
younger, with no enrolled students younger than 20 years old. An additional 24.8 % (n = 82) were older than 30 years of age, but no more than 40 years old and the remaining 5.2 % (n = 17) was 41 years old or older, with a maximum age of 51 years. Figure 2 illustrates the progression of student ages and provides an illustration of the multi-generational student body of the diploma nursing program.

Table 1

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<tr>
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Total 330 100.0

Range: 20 – 51 years

Mean age: 28.0 years

Mode: 25 years

*Calculated using student’s date of birth and the date of program entry

Figure 2. Diploma Nursing Program Graduate Ages Grouped at 5-Year Intervals
Race

Race was reported as indicated by the student according to categories consistent with the Integrated Post-Secondary Educational Data System (IPEDS). Caucasian students represented 90.9% of the enrollment \((n = 300)\) and Black or African American 6.7% \((n = 22)\). The remaining 2.4% represented Hispanic/Latino \((n = 5, 1.5\%)\), Asian \((n = 2, 0.6\%)\) and Native Hawaiian/Pacific Islander \((n = 1, 0.3\%)\). Table 2 illustrates race data for program graduates. The relative proportion of Caucasian students to African American, or Black, and all other students is depicted in Figure 3.

Table 2

<table>
<thead>
<tr>
<th>Race Categorya</th>
<th>(n)</th>
<th>%</th>
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</tr>
<tr>
<td>Black or African American</td>
<td>22</td>
<td>6.7</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
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<td>1.5</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
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<td>0.3</td>
</tr>
<tr>
<td>Caucasian</td>
<td>300</td>
<td>90.9</td>
</tr>
<tr>
<td>Total</td>
<td>330</td>
<td>100.0</td>
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</tbody>
</table>

aSelf-reported student data at enrollment using IPEDS categories

Figure 3. Summary of Diploma Nursing Program Graduates Reported Race
Gender

While gender is not reported for consideration in the admission process, following admission, students indicate gender as either female or male on a demographic survey form. Compiled data for this study indicated that the majority of students enrolled in this diploma nursing program during the eleven year period studied were female \((n = 300, 90.9\%)\). The remaining 9.1\% of the student body were males \((n = 30)\).

Marital Status

With respect to marital status, students were categorized as single, married or divorced. The students’ marital status was noted at the time they entered the program and again at the time of graduation or attrition from the program. At time of entry into the diploma program, most students were single \((n = 170, 51.5\%)\), but by graduation from the program, more of the students were married \((n = 179, 44.2\%)\) than single. Table 3 summarizes the data related to marital status at program entry and departure points.

Table 3

<table>
<thead>
<tr>
<th>Marital Status(^a)</th>
<th>Program Entry</th>
<th>Program Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>(%)</td>
</tr>
<tr>
<td>Single</td>
<td>170</td>
<td>51.5</td>
</tr>
<tr>
<td>Married</td>
<td>146</td>
<td>44.2</td>
</tr>
<tr>
<td>Divorced</td>
<td>14</td>
<td>4.3</td>
</tr>
<tr>
<td>Totals</td>
<td>330</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(^a\)Selection options were limited to single, married or divorced.

Number of Children

At the time of enrollment, each student reported the number of children they had currently.

Most students were childless \((n = 181, 54.9\%)\), with a range of children among students from none to five. The data related to number of children is presented in Table 4.
Table 4

Number of Children Diploma Nursing Program Graduates Reported During Enrollment

<table>
<thead>
<tr>
<th>Number of Children</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>181</td>
<td>54.9</td>
</tr>
<tr>
<td>1</td>
<td>74</td>
<td>22.4</td>
</tr>
<tr>
<td>2</td>
<td>59</td>
<td>17.9</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>3.3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Totals</td>
<td>330</td>
<td>100.0</td>
</tr>
</tbody>
</table>

aNumber of children is collected as demographic data for entering students and adjusted during enrollment if the number changes.

**Completion Status Relative to Program Length**

The specific completion status of students was further delineated with respect to the amount of time required to complete the program as 24 months, 36 months or 48 months. The curriculum design supports program completion with 24 months and 80.6% (n = 266) of students were able to graduate within this time frame. Students with an interrupted course of study, but who successfully completed the program represented 15.5% (n = 51) at 36 months and 1.5% (n = 5) at 48 months. The remaining 2.4% (n = 8) represents students who are currently enrolled in the diploma program and on track to graduate in December 2010. Table 5 summarizes completion status for all subgroups described.

Table 5

Completion Status of Diploma Nursing Program Graduates as a Percentage of the Sample

<table>
<thead>
<tr>
<th>Completion Status</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduated, 24 months</td>
<td>266</td>
<td>80.6</td>
</tr>
<tr>
<td>Graduated, 36 months</td>
<td>51</td>
<td>15.5</td>
</tr>
<tr>
<td>Graduated, 48 months</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Graduation pendinga</td>
<td>8</td>
<td>2.4</td>
</tr>
<tr>
<td>Totals</td>
<td>330</td>
<td>100.0</td>
</tr>
</tbody>
</table>

aStudents with graduation pending anticipate graduation in 2010 with a 36-month time frame.
Objective 2

Objective two sought to describe students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 and graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) on selected program admission criteria:

1. Nurse Entrance Test (NET®) composite percentile

2. NET® Critical Thinking Scales
   i. Main Idea of Passage,
   ii. Inferential Reading
   iii. Predicting Outcomes

3. Calculated Grade Point Average (GPA) for 25 hours of required college prerequisite courses, and

4. Calculated Program Predictive Grade Point Average (PGPA) for program predictive college prerequisite courses (Algebra, English Composition, Anatomy, Physiology and selected remaining course with the highest earned letter grade).

Nurse Entrance Test (NET®) Composite Percentile

Admission criteria for the diploma nursing program required applicants to have a minimum composite percentile of 50 on the NET® exam in order to be selected for admission. Although a raw percentage score was also available, the program elected to rank students based on the nationally norming of the percentile rank. The mean composite percentile was 80.9 ($n = 330$, $SD = 12.6$). The range was found to be 46 to 99. A summary of the NET® composite percentiles are included in Table 6.
NET® Critical Thinking Scales

The critical thinking scales on the NET® exam are represented by the main idea of the passage, inferential reading and predicting outcomes. With the class entering January 2005, the admission criteria were increased to require applicants to have a minimum score of 50% on each component of the critical thinking scales. Prior to that time, the requirement was that applicants have an average of 50% for the combination of all three components. The mean score for main idea of the passage was 82.2% \((SD = 12.7)\). Inferential reading and predicting outcomes showed lower scores at 68.8% \((SD = 13.7)\) and 63.1% \((SD = 12.7)\) respectively. Table 6 presents a summary of NET® scores.

Table 6

<table>
<thead>
<tr>
<th>NET® Component</th>
<th>M</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>NET® Composite Percentilea</td>
<td>80.9</td>
<td>12.6</td>
<td>46</td>
<td>99</td>
</tr>
<tr>
<td>Main Idea of Passageb</td>
<td>82.2</td>
<td>12.7</td>
<td>42</td>
<td>100</td>
</tr>
<tr>
<td>Inferential Readingb</td>
<td>68.8</td>
<td>13.7</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Predicting Outcomesb</td>
<td>63.1</td>
<td>12.7</td>
<td>18</td>
<td>100</td>
</tr>
</tbody>
</table>

aMinimum Composite Percentile of 50 required by applicants
b1998-2004 an average of 50% for these three components was required. Beginning January 2005 the components were not averaged and a minimum of 50% in each component was required.

Prerequisite Grade Point Average (GPA)

The GPA represents the calculated GPA for 25 hours of required general education college courses. General education requirements include a three-credit hour course each for English Composition, College Algebra, Human Anatomy, Human Physiology, General Psychology, Developmental Psychology, Nutrition, and Microbiology and a one-credit hour Microbiology laboratory course. The diploma program admission criteria require this calculated GPA to be 2.7 or
higher. The mean GPA for program graduates was 3.16 (SD = .3) with a range of 2.7 to 4.0 on a four-point scale.

**Program Predictive Grade Point Average (PGPA)**

The program predictive grade point average represents a calculation based on the student’s earned grade in English Composition, College Algebra, Human Anatomy, Human Physiology and one other three-credit hour course in which the student has posted the highest grade. Among students who completed the program, the minimum value for the PGPA is 2.0, as a minimum course grade of C is required for all prerequisite college courses. The mean PGPA for program graduates was 3.24 (SD = .3) with a range of 2.4 to 4.0 on a four-point scale.

**Objective 3**

Attrition in the diploma nursing program was represented by the portion of the total enrollment during the 11-year period studied who enrolled and withdrew or were dismissed and thus never completed the program. The diploma program experienced a 29.7% attrition rate, as of the 470 students enrolled, 140 students failed to complete the program. The purpose of objective 3 was to describe students who comprised this attrition component, having enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 but withdrew or were dismissed and never graduated from the program on selected admission criteria and academic characteristics:

1. Nurse Entrance Test (NET®) composite percentile,
   a. NET® Critical Thinking Scales,
   b. Main Idea of Passage,
   c. Inferential Reading,
2. Predicting Outcomes, Calculated Grade Point Average (GPA) for 25 hours of required college prerequisite courses, and

3. Calculated Program Predictive Grade Point Average (PGPA) for program predictive college prerequisite courses (Algebra, English Composition, Anatomy, Physiology and selected remaining course with the highest earned letter grade).

4. Amount of program completed based on semester enrolled at time of withdrawal or dismissal from school,

5. Enrolled courses at the time of withdrawal or dismissal from school, and

6. Reason for withdrawal or dismissal from school.

**NET® Composite Percentile**

Students in the non-completer group \((n = 140)\) achieved a mean NET® Composite Percentile of 76.7 \((SD = 14.0)\). The students scored in a range from the 46\(^{th}\) percentile to the 99\(^{th}\) percentile. As noted, the admissions requirements include that the NET® Composite percentile must be at or above the 50\(^{th}\) percentile. Data reported below this point were verified for accuracy and found to be actual student scores. No explanation was available for the variance. The results of the NET® Composite Percentile are presented along with the NET® Critical Thinking Scores in Table 7.

**NET® Critical Thinking Scales**

The program Non-completers \((n = 140)\) demonstrated descending mean scores as the components increased in critical thinking difficulty from main idea of passage, to inferential reading and predicting outcomes, showing means as 79.2, 65.3, 61.4 respectively. Table 7 includes the data for comparison. This pattern was noted with the first group of applicants for the students entering January 1998. At that time, applicants were required to have a minimum of 50\% as an average for the three Critical Thinking
Scales. As the pattern continued, for January 2005 enrollment, the program increased the admission criteria to require a minimum score of 50% on each of the three components.

**Prerequisite Grade Point Average (GPA)**

The GPA represents the calculated GPA for 25 hours of required general education college courses. General education requirements include a three-credit hour course each for English Composition, College Algebra, Human Anatomy, Human Physiology, General Psychology, Developmental Psychology, Nutrition, and Microbiology and a one-credit hour Microbiology laboratory course. The diploma program admission criteria require this calculated GPA to be 2.7 or higher. The mean GPA for program Non-completers was 3.05 ($SD = .3$) with a range of 2.6 to 4.0 on a four-point scale.

Table 7


<table>
<thead>
<tr>
<th>NET® Component</th>
<th>$M$</th>
<th>$SD$</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>NET® Composite Percentile$^a$</td>
<td>76.7</td>
<td>14.1</td>
<td>46</td>
<td>99</td>
</tr>
<tr>
<td>Main Idea of Passage$^b$</td>
<td>79.2</td>
<td>15.0</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Inferential Reading$^b$</td>
<td>65.3</td>
<td>14.4</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td>Predicting Outcomes$^b$</td>
<td>61.4</td>
<td>11.2</td>
<td>36</td>
<td>90</td>
</tr>
</tbody>
</table>

$^a$Minimum Composite Percentile of 50 required by applicants

$^b$1998-2004 an average of 50% for these three components was required. Beginning January 2005 a minimum of 50% in each component was required.

**Program Predictive Grade Point Average (PGPA)**

The program predictive grade point average represents a calculation based on the student’s earned grade in English Composition, College Algebra, Human Anatomy, Human Physiology and one other three-credit hour course in which the student has posted the highest grade. The minimum value for the PGPA is 2.0, as a minimum course grade of C is required for all prerequisite college courses.
The mean PGPA for students who did not complete the program was 3.12 ($SD = .3$) with a range of 2.4 to 4.0 on a four-point scale.

**Amount of Program Completed**

Upon entering the diploma nursing program, students have completed 25 credit hours of general education courses which provide introductory material to serve as a basis for understanding the nursing curriculum courses. These courses focus primarily on science and humanities courses. Initial nursing courses, during the spring semester and summer term, are designed to serve as foundational courses within the nursing curriculum plan. Courses such as Pharmacology, Introduction to Nursing I and Introduction to Nursing II are designated as Level I courses and begin to expose the student to nursing concepts as they relate to human conditions. The material moves from basic to complex. Student success in these early courses impacts their ability to perform to expectations in upper level courses within the two-year program. To more clearly describe the attrition experienced by the program, data was collected and analyzed relative to the semester, or term, in which the student departed the program (Table 8). The data revealed that most students left the program within the first term ($n = 74, 52.9\%$) having completed less than 25% of the program and the majority of students who never graduate have left within the first year ($n = 128, 91.4\%$) having successfully completed less than 50% of the diploma program. As students enter Level II courses, the expected difficulty increases, as the courses build upon the student’s retention of Level I material. The Level II experience is comparable to the junior and senior years in a four-year college curriculum plan. The final semester of enrollment comprises the Level III courses and expands knowledge of particular patient populations, specifically the Maternal-Newborn group. Additionally, it emphasizes the student’s ability to manage a greater number of patients simultaneously while more rapidly synthesizing and acting on information. This allows for evaluation of the demonstration of critical thinking skills in the practice setting, mentoring and further
skill development. Figure 4 depicts the differential attrition of students from the program relative to the increasing difficulty of material as student’s progress through the nursing program.

Table 8

Amount of Curriculum Completed by Diploma Nursing Program Non-completers

<table>
<thead>
<tr>
<th>Point of Departure (% of Program Completed)</th>
<th>Course Level</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Semester of Year Entered (22%)</td>
<td>Level I</td>
<td>74</td>
<td>53.0</td>
</tr>
<tr>
<td>Summer Term of Year Entered (33%)</td>
<td>Level I</td>
<td>23</td>
<td>16.4</td>
</tr>
<tr>
<td>Fall Semester of Year Entered (55%)</td>
<td>Level II</td>
<td>31</td>
<td>22.1</td>
</tr>
<tr>
<td>Spring Semester of Second Year (77%)</td>
<td>Level II</td>
<td>10</td>
<td>7.1</td>
</tr>
<tr>
<td>Fall Semester of Second Year (&gt;78%)</td>
<td>Level III</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>140</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4. Differential Attrition of Diploma Nursing Program Students by Level of Course at Point of Student Departure
Enrolled Course(s) at the Point of Departure

Students are enrolled in specific courses each semester according to the diploma program’s established program of study. During the spring semester and summer term of the first year of study, all students in the admission class cohort are assigned to the same nursing courses. These courses, identified as Level I courses, include Pharmacology in Nursing and Introduction to Nursing I in the spring semester and Introduction to Nursing II in the summer term. Each clinical nursing course is a 7-credit hour course with a minimum of 64 classroom lecture hours and 126 clinical practice/laboratory hours built into the course design. With the beginning of the fall semester of the first year of study, students enter Level II courses and are randomly assigned to two sections for sequencing of these clinical nursing courses in order to balance the enrollment numbers within the individual courses. Level II clinical nursing courses are taught by specific content areas relative to patient populations. The courses are presented in a series of two courses which again build from basic to complex with respect to the subject matter contained within the course. A student must successfully complete the first course in the series in order to progress to the second course. Course names designate content area and patient population and include a designation of I or II to denote the sequence in the series. An example would be Child and Mental Health Nursing I and Child and Mental Health Nursing II. Additionally, beginning with this fall semester, students must complete a one-credit hour Nursing Seminar course each semester that includes nursing history, nursing education, nursing theorists, practice issues and healthcare trends. In the fall semester of the second year of study, students complete their final nursing seminar course and enter Level III clinical nursing courses, to which they are again randomly assigned to course sequencing.

Upon completion of the spring semester of the first year of enrollment, students who complete both courses successfully progress to the summer term clinical nursing course. Students who
successfully complete only one of the two courses must withdraw from the program, but usually maintain eligibility to apply for readmission to the class the following spring semester. If any student eligible for readmission fails to submit an application for the following spring semester, they are no longer eligible for readmission and must instead apply to the general applicant pool for admission consideration. The length of interruption in study for enrolled students seeking readmission cannot exceed the point at which the course sequence for their program of study is next offered. Any time elapsed beyond this point nullifies the student’s eligibility for readmission. Students who are not successful in either course are not eligible to apply for readmission. This final group of students may however, apply for general admission via the general applicant pool for the next or any subsequent admission year.

Data analysis related to the course in which students were enrolled at the time of their departure from the program supported the departure trends associated with the amount of the curriculum completed by these students. The largest percentage of students (32.9%, \( n = 46 \)) in the sample departed following unsuccessful completion of the co-requisite first semester courses, Introduction to Nursing I and Pharmacology in Nursing. This status also rendered them ineligible to apply for readmission and therefore provided an early indicator that they would become program Non-completers. An additional 20.7% of Level I students \( (n = 29) \) failed at least one of the initial nursing courses, with Pharmacology in Nursing representing the greater frequency for failure. Beyond Level I courses, Nursing of Adults I proved the greatest attrition point for Level II students with 17.1% of the program Non-completers withdrawing or being dismissed from this course. Table 9 provides a summary of findings related to enrolled course at the time of program departure for program Non-completers. Only one course, Management in Nursing, a Level III course, experienced no attrition. The course was not included in Table 9.
Table 9

Course in Which Diploma Nursing Program Non-completers were Enrolled at the Time of Program Departure

<table>
<thead>
<tr>
<th>Nursing Course</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacology in Nursing</td>
<td>26</td>
<td>18.6</td>
</tr>
<tr>
<td>Introduction to Nursing I</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Pharmacology in Nursing/Introduction to Nursing I</td>
<td>46</td>
<td>32.9</td>
</tr>
<tr>
<td>Introduction to Nursing II</td>
<td>24</td>
<td>17.1</td>
</tr>
<tr>
<td>Nursing of Adults I</td>
<td>24</td>
<td>17.1</td>
</tr>
<tr>
<td>Nursing of Adults II</td>
<td>6</td>
<td>4.4</td>
</tr>
<tr>
<td>Child and Mental Health Nursing I</td>
<td>5</td>
<td>3.6</td>
</tr>
<tr>
<td>Child and Mental Health Nursing II</td>
<td>4</td>
<td>2.9</td>
</tr>
<tr>
<td>Maternal-Newborn Nursing</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>140</td>
<td>100</td>
</tr>
</tbody>
</table>

aNursing courses listed represent only courses within the program which had associated attrition.
bCourses are co-requisites, but were separately displayed if a failure/withdrawal from only one course.
cDesignation represents students unsuccessful in both courses within the same semester.

**Reason for Withdrawal or Dismissal from School**

At the time of withdrawal or dismissal from school, the process captures the reason for withdrawal or dismissal. When more than one factor is involved, the factor believed by the student to be the greatest contributor to the situation experienced is the reason noted. For example, if a student is experiencing family or personal issues, but also has financial or health issues, the student is asked to reflect on the reason with the greatest impact on the lack of success or reason they are unable to continue. If a student was experiencing financial issues, but also posted an academic or clinical failure, they are asked to evaluate whether they would have the means to continue if they had not experienced the failure. If the financial issues, in and of themselves would not have resulted in withdrawal, the
academic or clinical failure status is noted. If the financial issues were overwhelming to the point that the student could neither concentrate nor study because of the work load as a wage earner or the stress of increasing financial hardship, the financial issue category was selected. The student-identified reason for departure does not impact the student’s status relative to eligibility for readmission.

Table 10

Diploma Nursing Program Non-completers Self-reported Reasons for Withdrawal or Dismissal

<table>
<thead>
<tr>
<th>Reason for Withdrawal or Dismissal(^a)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic and/or clinical failure</td>
<td>109</td>
<td>77.9</td>
</tr>
<tr>
<td>Personal or family issues</td>
<td>12</td>
<td>8.5</td>
</tr>
<tr>
<td>Regulatory issues</td>
<td>7</td>
<td>5.0</td>
</tr>
<tr>
<td>Financial issues</td>
<td>6</td>
<td>4.3</td>
</tr>
<tr>
<td>Health or pregnancy</td>
<td>6</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>140</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(^a\)Reason for withdrawal is completed by the student during the withdrawal/dismissal process. If more than one factor is present, the factor deemed by the student to be the greatest contributor to withdrawal or dismissal is indicated. Student-identified reason for withdrawal does not impact readmission eligibility.

The results for the 140 program Non-completers (Table 10) indicated that the most frequently reported factor was academic or clinical failure, accounting for 77.9% \((n = 109)\) of student withdrawal or dismissal from the program. Personal or family issues \((8.5\%, n = 12)\) accounted for the second highest reason for program departure. The remaining factors in descending order of frequency with which they were reported, included: regulatory issues \((5\%, n = 7)\), with financial reasons \((4.3\%, n = 6)\) and health or pregnancy \((4.3\%, n = 6)\) sharing the final ranking. Regulatory issues, while a small percentage, are a practically significant attrition factor. Regulatory factors involve student current or historical incidents resulting in legal involvement or intervention that falls within the legal statutes.
enforced by the state board of nursing. The process for clearing students for participation in clinical courses may delay the student’s ability to enroll, continue or progress.

**Objective 4**

Having previously described the program Completers and the program Non-completers, the purpose of Objective 4 was to compare the two groups on selected admission criteria. The primary purpose sought in this comparison was to determine whether there were any statistically significant differences between the groups related to the program’s established admission criteria. Examination of any identified differences may provide opportunities to adopt changes to the admission criteria that could positively impact retention.

In order to conduct the comparison between groups on the identified characteristics, the difference between group means for Completers and Non-completers will be tested for statistical significance relative to each admission criterion studied. This will be achieved by testing hypotheses about these two independent means using the independent-samples *t* test. Use of this statistical procedure involves the testing of the null hypothesis that there is no difference between the means of the two groups: Completers and Non-completers on the specific components measured. As an inferential statistic, this procedure will assist in determining the probability that the difference found between the samples, Completers and Non-completers, would have occurred if there was really no differences in the total population of enrolled students. As there is no supposition as to the direction of any differences between group’s means which may identified, a two-tailed test was used. The level of significance for rejecting the null hypothesis was set at $\alpha = .05$. Prior to using the *t*-test, the underlying test assumptions were validated, including: all observations were independent; the sum of the sample sizes for the two groups was greater than 40 ($N = 470$), so normality was not required; and the groups were examined for equal variance. To determine equality of variances, Levene’s test for equality of
variances was used. If the value reported for the significance level for the Levene test was small ($< .005$), equal variances was not assumed and the reported values indicated under “Equal variances not assumed” were used (Norusis, 2008).

**NET® Composite Percentile**

Analysis of the NET® Composite Percentile using the $t$-test revealed a difference in the means between the groups: Completers ($M = 80.9$, $SD = 12.6$, $n = 330$) and Non-completers ($M = 76.7$, $SD = 14.1$, $n = 140$). With equal variances not assumed through Levene’s Test, the $t$-test indicated the difference between the two groups was statistically significant, with an outcome of $t(237) = 3.007$, $p = .003$. Therefore, the Completers had a statistically higher mean score for the NET® Composite Percentile than the Non-completers. For a summary of values related to the $t$-test see Table 11.

**NET® Critical Thinking Scales**

Each NET® Critical Thinking Scale was examined individually for significance between the groups. The Main Idea of Passage for Completers showed ($M = 82.2$, $SD = 12.7$, $n = 330$), as compared to Non-completers with values of ($M = 79.2$, $SD = 15.0$, $n = 140$). As the smaller sample of the total student population used for the study, Non-completers showed both a lower mean score and greater variation among the scores. This difference was statistically significant, with equal variances not assumed using Levene’s test, the $t$-test indicated $t(227) = 2.052$, $p = .041$. Inferential reading revealed group differences, with Completers ($M = 68.8$, $SD = 13.7$, $n = 330$) demonstrating mean scores which were significantly higher than Non-completers ($M = 65.3$, $SD = 14.4$, $n = 140$). These values also represented a significant difference, as $t(468) = 2.525$, $p = .012$. Predicting outcomes posted the smallest mean differences between the groups and the lowest standard deviation. Reported values were: Completers ($M = 63.1$, $SD = 12.7$, $n = 330$) and Non-completers ($M = 61.4$, $SD = 11.2$, $n = 140$). This was the only critical thinking scale which did not demonstrate a statistically significant difference.
between the groups with actual values of $t(468) = 1.354, p = .176$. Table 11 provides summary results for the components of the critical thinking scales.

**Prerequisite Grade Point Average (GPA)**

Admission requirements include that applicants must complete 25-credit hours of specified general education courses. Each course requires a minimum letter grade of C, with a calculated GPA for the entire group of these general education courses no lower than 2.7 (without rounding) on a 4.0 scale. This requirement creates a restricted range for this admission variable. Although inspection of the difference between the group means reveals only a slight difference: Completers ($M = 3.16, SD = .32, n = 330$) and Non-completers ($M = 3.06, SD = .30, n = 140$), calculating the $t$ statistic reveals a statistically significant difference with values of $t(468) = 3.178, p = .002$, as noted in Table 11.

**Program Predictive Grade Point Average (PGPA)**

The calculated PGPA is the result of the earned grade in four specific prerequisite college courses and one additional prerequisite college course with the highest earned letter grade. Although there is no required minimum value for the PGPA, all prerequisite college courses require a minimum earned grade of “C”, giving the PGPA a restricted range from 2.0 to 4.0 on a four-point scale. The courses of Algebra, English Composition, Human Anatomy and Human Physiology, along with the remaining fifth course were adopted by the Admissions and Selections Committee in 1998 as method for creating an additional data point on which to compare applicants in the general applicant pool. The PGPA does not serve as an isolated factor, but rather as another point in the profile for ranking applicants in consideration of all potential students. Examination of the difference between group means, as noted in Table 11, reveals minimal difference: Completers ($M = 3.24, SD = .34, n = 330$) and Non-completers ($M = 3.12, SD = .34, n = 140$), calculating the $t$ statistic reveals the difference is statistically significant with values of $t(468) = 3.562, p = .000$. 
Table 11
Diploma Nursing Program Completers versus Non-completers: A Comparison of Admission Criteria

<table>
<thead>
<tr>
<th>Admission Criterion</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>F</th>
<th>Sig</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NET® Composite Percentile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Completers</td>
<td>330</td>
<td>80.9</td>
<td>12.6</td>
<td>4.582</td>
<td>.033</td>
<td>3.007</td>
<td>.003</td>
</tr>
<tr>
<td>Non-completers</td>
<td>140</td>
<td>76.7</td>
<td>14.1</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>NET® Critical Thinking Scales</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Idea of Passage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completers</td>
<td>330</td>
<td>82.2</td>
<td>12.7</td>
<td>11.7</td>
<td>.001</td>
<td>2.052</td>
<td>.041</td>
</tr>
<tr>
<td>Non-completers</td>
<td>140</td>
<td>79.2</td>
<td>15.0</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Inferential Reading</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Completers</td>
<td>330</td>
<td>68.8</td>
<td>13.7</td>
<td>.326</td>
<td>.568</td>
<td>2.525</td>
<td>.012</td>
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<tr>
<td>Non-completers</td>
<td>140</td>
<td>65.3</td>
<td>14.4</td>
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<td></td>
</tr>
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<td>Predicting Outcomes</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completers</td>
<td>330</td>
<td>63.1</td>
<td>12.7</td>
<td>1.179</td>
<td>.278</td>
<td>1.354</td>
<td>.176</td>
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<td>Non-completers</td>
<td>140</td>
<td>61.4</td>
<td>11.2</td>
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<tr>
<td>Calculated GPA</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Completers</td>
<td>330</td>
<td>3.16</td>
<td>.32</td>
<td>2.258</td>
<td>.134</td>
<td>3.178</td>
<td>.002</td>
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<tr>
<td>Non-completers</td>
<td>140</td>
<td>3.06</td>
<td>.30</td>
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<td></td>
</tr>
<tr>
<td>Calculated PGPA</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completers</td>
<td>330</td>
<td>3.24</td>
<td>.34</td>
<td>0.33</td>
<td>.856</td>
<td>3.562</td>
<td>.000</td>
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<tr>
<td>Non-completers</td>
<td>140</td>
<td>3.12</td>
<td>.34</td>
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</tr>
</tbody>
</table>

*If Levene’s Test indicated significant F with equal variances not assumed, df are indicated separately.

b $df = 237$

c $df = 227$
Objective 5

The purpose of Objective 5 is to examine the group of enrolled students who experienced an interruption in their program of study by comparing those who returned and successfully completed the program to those who returned and then ultimately remained Non-completers of the program. For the purpose of comparison, selected admission criteria were utilized, including: NET® Composite Percentile, NET® Critical Thinking Scales (main idea of passage, inferential reading, and predicting outcomes), calculated GPA and calculated Program Predictive GPA. As noted in Figure 1, this comparison involves the groups Completers: Interrupted Study and Non-completers: Failed after Second Readmission.

As with Objective 4, testing procedures involved comparison of the difference between group means for Completers: Interrupted Study \((n = 64)\) and Non-completer: Failed after Second Readmission \((n = 41)\). This will be achieved by testing hypotheses about these two independent means using the two-independent-samples \(t\) test. As there is no supposition as to the direction of any differences between group’s means which may identified, a two-tailed test was used. The level of significance for rejecting the null hypothesis was set at \(\alpha = .05\). Prior to using the \(t\)-test, the underlying test assumptions were validated, including: all observations were independent; the sum of the sample sizes for the two groups was greater than 40 \((N = 105)\), so normality was not required; and the groups were examined for equal variance. To determine equality of variances, Levene’s test for equality of variances was used. If the value reported for the significance level for the Levene test was small \((< .005)\), equal variances was not assumed and the reported values indicated under “Equal variances not assumed” were used (Norusis, 2008). When this circumstance existed, the associated adjustment provided for degrees of freedom was noted in the results and also provided in the respective table for that component.
**NET® Composite Percentile**

Analysis of the NET® Composite Percentile using the $t$-test revealed a mean difference between the groups: Completers: Interrupted Study ($M = 77.7$, $SD = 13.4$, $n = 64$) and Non-completers: Failed after Second Readmission ($M = 77.9$, $SD = 13.6$, $n = 41$). With equal variances not assumed through Levene’s Test, the $t$-test indicated the difference between the two groups was not statistically significant, with an outcome of $t(84) = .064$, $p = .949$. For a summary of values related to the $t$-test see Table 12.

**NET® Critical Thinking Scales**

Each of the NET® Critical Thinking Scales was examined individually for significance between the groups. The Main Idea of Passage for Completers: Interrupted Study showed ($M = 81.5$, $SD = 12.6$, $n = 64$), as compared to Non-completers: Failed after Second Readmission with values of ($M = 77.5$, $SD = 15.9$, $n = 41$). As the smaller sample of the total student population used for the study, Non-completers showed both a lower mean score and greater variation among the scores. This difference was not statistically significant, with equal variances not assumed using Levene’s test, the $t$-test indicated $t(71) = -1.346$, $p = .183$. Inferential reading revealed group differences of: Completers: Interrupted Study ($M = 67.3$, $SD = 13.1$, $n = 64$), while Non-completers: Failed after Second Readmission showed values of ($M = 63.9$, $SD = 12.9$, $n = 41$). These values also did not represent a significant difference, as $t(103) = -1.326$, $p = .188$. Predicting outcomes reported values were: Completers: Interrupted Study ($M = 63.2$, $SD = 12.2$, $n = 64$) and Non-completers ($M = 60.7$, $SD = 10.3$, $n = 41$). This critical thinking scale again did not demonstrate a statistically significant difference between the groups defined according to successful program completion following an interruption in study with actual values of $t(103) = -1.094$, $p = .277$. Therefore, no statistical significance was found.
relative to the NET® Critical Thinking Scales between students with interrupted study who were Completers and those who were Non-Completers.

**Prerequisite Grade Point Average (GPA)**

Admission requirements include that applicants must complete 25-credit hours of specified general education courses. Each course requires a minimum letter grade of C, with a calculated GPA for the entire group of these general education courses no lower than 2.7 (without rounding) on a 4.0 scale. This requirement creates a restricted range for this admission variable. Inspection of the difference between the group means reveals only a slight difference: Completers: Interrupted Study ($M = 3.0, SD = .28, n = 64$) and Non-completers: Failed after Second Readmission ($M = 2.9, SD = .23, n = 41$), calculating the $t$ statistic reveals the difference is not statistically significant with values of $t(103) = -.852, p = .396$.

**Program Predictive Grade Point Average (PGPA)**

The calculated PGPA derives from earned grade in four specific prerequisite college courses and one additional prerequisite with the highest earned letter grade. There is no required minimum value for the PGPA, but with the required minimum earned grade of “C” a restricted range exists from 2.0 to 4.0 on a four-point scale. The selected courses were adopted by the Admissions and Selections Committee in 1998 as method for creating an additional data point on which to compare applicants in the general applicant pool. The PGPA does not serve as an isolated factor, but rather as another point in the profile for ranking applicants in consideration of all potential students. Examination of the difference between group means reveals minimal difference: Completers: Interrupted Study ($M = 3.1, SD = .3, n = 64$) and Non-completers: Failed after Second Readmission ($M = 3.0, SD = .32, n = 41$), calculating the $t$ statistic reveals the difference is not statistically significant with values of $t(103) = -.714, p = .477$. 

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Table 12
 Interruption in Study: A Comparison of Admission Criteria between Diploma Nursing Program Completers and Non-completers

<table>
<thead>
<tr>
<th>Admission Criterion</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Levene’s Test (df = 103)</th>
<th>Independent Samples t-Test (2-tailed)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>NET® Composite Percentile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completers: Interrupted Study</td>
<td>64</td>
<td>77.7</td>
<td>13.5</td>
<td>.001&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.973</td>
</tr>
<tr>
<td>Non-completers:</td>
<td>41</td>
<td>77.9</td>
<td>13.6</td>
<td>.949</td>
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<td>NET® Critical Thinking Scales</td>
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<tr>
<td>Main Idea of Passage</td>
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<td></td>
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<tr>
<td>Completers</td>
<td>64</td>
<td>81.5</td>
<td>12.6</td>
<td>6.464&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.012</td>
</tr>
<tr>
<td>Non-completers</td>
<td>41</td>
<td>77.5</td>
<td>15.9</td>
<td>.183</td>
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<tr>
<td>Inferential Reading</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Completers</td>
<td>64</td>
<td>67.3</td>
<td>13.1</td>
<td>.150</td>
<td>.699</td>
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<tr>
<td>Non-completers</td>
<td>41</td>
<td>63.9</td>
<td>12.9</td>
<td>.188</td>
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<tr>
<td>Predicting Outcomes</td>
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<tr>
<td>Completers</td>
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<td>63.2</td>
<td>12.2</td>
<td>.184</td>
<td>.669</td>
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<td>Non-completers</td>
<td>41</td>
<td>60.7</td>
<td>10.3</td>
<td>.294</td>
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<tr>
<td>Completers</td>
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<td>1.230</td>
<td>.270</td>
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<td>Non-completers</td>
<td>41</td>
<td>2.9</td>
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<td>.396</td>
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<tr>
<td>Calculated Predictive GPA</td>
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<td></td>
</tr>
<tr>
<td>Completers</td>
<td>64</td>
<td>3.1</td>
<td>.30</td>
<td>.017</td>
<td>.897</td>
</tr>
<tr>
<td>Non-completers</td>
<td>41</td>
<td>3.0</td>
<td>.32</td>
<td>-.714</td>
<td>.477</td>
</tr>
</tbody>
</table>

<sup>a</sup> If Levene’s Test indicated significant F with equal variances not assumed, df are indicated separately.

<sup>b</sup> df = 84

<sup>c</sup> df = 71
CHAPTER 5
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Purpose and Objectives

The purpose of this study is to examine the retention of nursing students in a diploma nursing program by describing their characteristics using demographic and academic variables. The students enrolled during the 11-year period studied will be placed into subgroups based on retention or attrition from the program and also according to continuous or interrupted study. The objectives of the study include:

1. To describe students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 who were Completers, having graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) on selected demographic characteristics:
   a. Age
   b. Race
   c. Gender
   d. Marital status at enrollment
   e. Marital status at completion
   f. Number of children during enrollment
   g. Completion status relative to program length

2. To describe students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 who were Completers, having graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) on selected program admission criteria:
a. Nurse Entrance Test (NET®) Composite Percentile,

b. NET® Critical Thinking Scales,
   i. Main Idea of Passage,
   ii. Inferential Reading
   iii. Predicting Outcomes

c. Calculated Grade Point Average (GPA) for 25 hours of required college prerequisite courses, and

d. Calculated Predictive Grade Point Average (PGPA) for program predictive college prerequisite courses (College Algebra, English Composition, Human Anatomy, Human Physiology and selected remaining course with highest earned letter grade).

3. To describe students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 but were Non-completers, because they withdrew or were dismissed and never graduated from the program, on selected admission criteria and academic characteristics:

   a. Nurse Entrance Test (NET®) Composite Percentile

   b. NET® Critical Thinking Scales
      i. Main Idea of Passage
      ii. Inferential Reading
      iii. Predicting Outcomes

   c. Calculated Grade Point Average (GPA) for 25 hours of required prerequisite college courses,

   d. Calculated Predictive Grade Point Average (PGPA) for program predictive prerequisite college courses (College Algebra, English Composition, Human
Anatomy, Human Physiology and selected remaining course with the highest earned letter grade),

e. Amount of program completed based on semester enrolled at time of withdrawal or dismissal from school,

f. Enrolled courses at the time of withdrawal or dismissal from school, and

g. Reason for withdrawal or dismissal from school.

4. To compare students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 and were Completers, having graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) with students who were Non-completers, because they withdrew or were dismissed and never graduated from the program, on selected admission criteria:

a. Nurse Entrance Test (NET®) Composite Percentile,

b. NET® Critical Thinking Scales
   i. Main Idea of Passage,
   ii. Inferential Reading,
   iii. Predicting Outcomes,

c. Calculated Grade Point Average (GPA) for 25 hours of prerequisite college courses, and

d. Calculated Predictive Grade Point Average (PGPA) for program predictive prerequisite college courses (Algebra, English Composition, Human Anatomy, Human Physiology and selected remaining course with the highest earned letter grade).
5. To compare students who were enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 who were Completers, having graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) and experienced interrupted study with students who were Non-completers, because they withdrew or were dismissed for a second failure after readmission and never graduated from the program on selected admission criteria:

   a. Nurse Entrance Test (NET®) Composite Percentile,

   b. NET® Critical Thinking Scales,
      i. Main Idea of Passage,
      ii. Inferential Reading,
      iii. Predicting Outcomes,

   c. Calculated Grade Point Average (GPA) for 25 hours of required college prerequisite courses, and

   d. Calculated Program Predictive Grade Point Average (PGPA) for program predictive prerequisite college courses (Algebra, English Composition, Human Anatomy, Human Physiology and selected remaining course with the highest earned letter grade).

**Procedures**

The target population for this study was the graduates of a diploma nursing program in the southern United States. The accessible population consisted of students graduating between December 1999 and December 2009, or who are projected to graduate in December 2010. The 11-year sample selected reflected the group of students for whom critical thinking scores were collected using the Nurse Entrance Test (NET®) developed by Educational Resources, Incorporated. The frame for the
accessible population was established by review of records for admission and enrollment for the years to be studied. In order to ensure an unduplicated count, students were attached to a cohort according to the year they entered the diploma program using a unique anonymous identifier, rather than the class with which they graduated. Students who were accepted for admission had to enter the program and remain enrolled a minimum of two weeks to be counted in the entry class cohort as an actively enrolled student.

A data collection tool spreadsheet was developed using Microsoft Excel® to allow for consistent extraction and reporting of specific student data. The spreadsheet allowed for capture by subject of all demographic and academic variables. The students were assigned an identifier based on the year of enrollment, such as 98-1, 98-2, and so on, allowing for grouping of cohort by class, calculation of age based on student’s date of birth and program start date for the associated year. After development of the data collection spreadsheet, sample data were recorded on the spreadsheet from a random sample of 50 student records. This allowed for determination of consistent points for capture of data, evaluation of the recording sequence relative to the flow of the spreadsheet and rewording of the column headings for preciseness in data capture. Following the final adjustments to the data collection spreadsheet, actual data collection began and was completed with a four-week time frame. A sample of the data collection spreadsheet is included in Appendix B. During this four-week period, if an element related to a student variable was not located in the record or was beyond the expected value for the variable, school personnel were available to identify where the data was contained in a record, provide supplemental data to complete the record or verify the accuracy of the data. Through this mechanism all data values were obtained; therefore no variables studied noted missing values. Once all data were identified for the variables, the spreadsheet was coded according to established values for each variable. Coding notes are included in Appendix C. Following coding, a random sample of 50 student
records was reviewed for coding accuracy. Coded data from the Excel® spreadsheet was imported into the Statistical Package for the Social Sciences (SPSS) version 17 for data analysis.

**Summary of Findings**

Completion status for the entire enrollment of the diploma nursing program during the 11-year period studied showed a retention rate of 70.2% (n = 330). Within the 29.8% (n = 140) of the student body representing attrition, it was further revealed that 67% (n = 94) of these students were not considered for readmission, either because they did not apply for readmission (n = 53, 56.4%) or because they were ineligible for readmission (n = 41, 43.6%). Of the 110 students considered for readmission, 95% (n = 105) were granted readmission and 5% (n = 5) were denied readmission. Attrition by students who were readmitted was 39% (n = 41).

For students who did not apply for readmission, the individual reasons noted by the students were grouped into broad categories. The 53 students who did not reapply were not limited to indicating only one reason for not applying for readmission. Therefore, of the 64 related responses, the most frequently noted reason, at 32.8% (n = 21) was a change in career. Many nursing students comment that they did not realize how difficult the role of the nurse would be until they were in nursing school. Other reasons for not applying for readmission included: financial reasons (n = 20, 31.2%), personal/family issues (n = 13, 20.3%), changed programs (n = 6, 9.4%), regulatory issues (n = 3, 4.7%) and relocation (n = 1, 1.6%).

**Objective 1**

Objective one described students enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 and graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) on selected demographic characteristics as indicated below.
Age

At the time of enrollment, student age was noted to range from 20 to 51 years. The mean age was 28.0 years ($n = 330$, $SD = 6.2$). The age distribution demonstrated that 70% of students ($n = 231$) were 30 years of age or younger.

Race

Caucasian students composed 90.9% ($n = 300$) of the program graduates during the 11-year period studied. Black or African American represented 6.7% ($n = 22$) and the remaining 2.4% ($n = 5$) represented other races. The other races were primarily Hispanic/Latino ($n = 5$), but also included Asian ($n = 2$) and Native Hawaiian/Pacific Islander ($n = 1$). Representation of Black or African-American students in the enrolled in this program is impacted by the program’s geographic location within 10 miles of a four other nursing education programs; including a Historically Black University, a community college, a religious based private college and a public university.

Gender

Compiled data for this study indicated that the majority of graduates from the diploma nursing program were female ($n = 300$, 90.9%). The remaining 9.1% ($n = 30$) were males.

Marital Status at Program Entry

For student reported marital status, selection was limited to single, married or divorced. Marital status at time of program entry showed most students were single ($n = 170$, 51.5%). Married students accounted for 44.2% ($n = 146$) of the enrollment cohorts. At the time of program entry, divorced students comprised only 4.3% ($n = 14$) of the class cohort.

Marital Status at Program Completion

By program graduation, a greater percentage of the students were married ($n = 179$, 54.2%). Students who were single represented 41.5% ($n = 137$) of the graduates. Although the portion of
students who were divorced appeared static ($n = 14, 4.3\%$), the data summary did not capture students’ change in marital status, so the value may represent a different group at each point of measure.

**Number of children**

The value recorded for students was captured at the time of program entry and adjusted based on change in number during enrollment, prior to graduation. No student suffered the loss of a child during enrollment. Most of the students were childless ($n = 181, 54.9\%$), with a group range of children from none to five. Further data collected revealed that $3.9\% (n = 13)$ of the students reported a pregnancy between entry into the program and program graduation.

**Completion Status Relative to Program Length**

Curriculum design supports diploma nursing program completion within 24 months of uninterrupted enrollment. $80.8\% (n = 266)$ of students were able to graduate within this time frame. Students who graduated despite interrupted study completed the program in either 36 months ($n = 51, 15.5\%$) or 48 months ($n = 5, 1.5\%$). The remaining $2.4\% (n = 8)$ represents students who are currently enrolled and on track to graduate in December 2010. Upon graduation, they would join the group with a 36-month completion status.

**Objective 2**

Objective two described students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 and graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) on selected program admission criteria included below.

**Nurse Entrance Test (NET®) Composite Percentile**

Admission criteria for the diploma nursing program required applicants to have a minimum composite percentile of 50 on the NET® exam in order to be selected for admission. The mean
composite percentile was 80.9 ($n = 330, SD = 12.6$). The composite percentile range was the 46th to the 99th percentile.

**NET® Critical Thinking Scales**

The critical thinking scales on the NET® exam include the main idea of the passage, inferential reading and predicting outcomes. The program noted a change to admission criteria for the class entering January 2005 to increase the requirement from an average score of 50% for the three, to a minimum score of 50% on each component. The mean score for main idea of the passage was 82.2% ($SD = 12.7$). Inferential reading and predicting outcomes showed smaller values at 68.8% ($SD =13.7$) and 63.1% ($SD = 12.7$) respectively.

**Prerequisite Grade Point Average (GPA)**

This calculated GPA reflects the average for the 25 hours or required general education college courses. The diploma program admission criteria require this calculated GPA to be 2.7 or higher. The GPA for program graduates was 3.16 ($SD = .3$) with a range of 2.6 to 4.0 on four-point scale.

**Program Predictive Grade Point Average (PGPA).**

The program predictive GPA represents a calculation based on the student’s earned GPA in four specific courses plus one additional required course in which the student has the highest earned letter grade. The diploma program does not specify a minimum value for the PGPA. The mean PGPA for program graduates was 3.24 ($SD = .3$) with a range of 2.4 to 4.0 on a four-point scale.

**Objective 3**

Objective three described students who enrolled in a diploma program in the southern United States between January 1998 and January 2008 but were Non-completers, because they withdrew or were dismissed and never graduates from the program, on the selected admission and academic characteristics that follow.
Nurse Entrance Test (NET®) Composite Percentile

Students in the non-completer group \((n = 140)\) achieved a mean NET® composite percentile of 76.7 \((SD = 14.0)\). These students scored in a range from the 46th percentile to the 99th percentile. As noted, the admissions requirements include that the NET® Composite Percentile must be at or above the 50th percentile. Data reported below this point were verified for accuracy and found to be actual student scores. No explanation was available for the variance.

NET® Critical Thinking Scales

The program Non-completers \((n = 140)\) demonstrated descending mean scores as the components increased in critical thinking difficulty from main idea of passage \((M = 79.2, SD = 15.0)\) to inferential reading \((M = 65.3, SD = 14.4)\) and predicting outcomes \((M = 61.4, SD = 11.2)\). The program admission requirements increased for the class entering January 2005 to require a minimum of 50% on each component, rather than an average of 50% for the three components.

Prerequisite Grade Point Average (GPA)

This calculated GPA represents the GPA for 25 hours of required general education college courses. The diploma program admission criteria require the calculated GPA to be 2.7 or higher. The mean GPA for program Non-completers was 3.05 \((SD = .3)\) with a range of 2.6 to 4.0 on a four-point scale.

Program Predictive Grade Point Average (PGPA)

The PGPA represents a calculation based on student’s earned grade in four specific prerequisite college courses and one other prerequisite course in which the student has the highest earned letter grade. The program does not specify a minimum value for the PGPA. However, a minimum letter grade of “C” is required for prerequisite courses. The mean PGPA for program Non-completers was 3.12 \((SD = .3)\) with a range of 2.4 to 4.0 on a four-point scale.
**Amount of Program Completed**

One component of the diploma program’s admission criteria is the completion of 25-credit hours of specific prerequisite college courses focusing on science and humanities courses which serve as a basis for understanding the courses presented in the nursing curriculum. The curriculum design with the diploma nursing program is a fast-paced sequencing of courses with material that moves from basic to complex. Student success in early courses impacts their ability to perform to expectations in upper level courses within the two-year program. The data revealed that most Non-completers leave the program within the first term ($n = 74, 53\%$) having completed less than 25% of the program. The majority of students who never graduate have left the program within the first year ($n=128, 91.5\%$) having successfully completed less than 55% of the diploma nursing program.

In addition to course designations, the diploma curriculum is described in Levels as Level I, Level II or Level III. Level I courses are completed in the spring semester and summer-term. Level I has three foundational courses. Of the two courses taken in the spring semester, one is a traditional lecture format and the other is a clinical nursing course. The clinical nursing course contains both lecture content and a clinical practicum. Therefore, the student is engaged in classroom, laboratory, or clinical work for a greater number of hours than a standard lecture course. The clinical nursing course presented over a 16-week semester has an average of four hours of lecture content per week and nine hours of clinical or laboratory content per week. During the summer term and in each subsequent semester, the clinical courses are presented in an eight week format; therefore there is an average of eight hours of lecture per week and 18 hours of clinical or laboratory content per week. In the fall semester of the first year, students enter Level II courses and the expected difficulty increases as the courses build on Level I knowledge and introduces more specific disease states and patient populations. The Level II experience is comparable to the junior and senior years in a four-year college
curriculum plan. Level III courses are taken the final semester before graduation are designed to expand the student’s knowledge of the Maternal-Newborn patient populations and the management of care for a larger number of patients. Level III courses emphasize the student’s ability to manage a greater number of patients simultaneously while more rapidly synthesizing and acting on information. These courses allow for evaluation of demonstrated critical thinking skills in the practice setting, mentoring, and further skill development. Student attrition by level for the Non-completers was found to be: Level I 69.4% (n = 97), Level II 29.2% (n = 41) and Level III 1.4% (n = 2).

**Enrolled Course(s) at the Point of Departure**

Students are enrolled in specific assigned courses each semester according to the school’s established program of study. Where there are course divisions requiring assignment of students to different courses, random assignment is used to determine the order in which a student completes courses. Students cannot self-select courses for sequencing or enrollment. Level II courses are presented in a series two of courses which build from basic to complex with respect to subject matter contained within the course. A student must successfully complete the first course in the series in order to progress to the second course.

Data analysis specific to enrolled course at time of student departure from the program supported the departure trends associated with the amount of curriculum completed by these students. The largest percentage of students (32.9%, n = 46) departed following unsuccessful completion of both the first semester courses. This combined failure meant they were ineligible to apply for readmission. An additional 20.7% of students (n = 29) failed at least one of the initial nursing courses, with Pharmacology in Nursing representing the greater challenge (n = 26, 18.6%). If a student was successful in Level I courses, Nursing of Adults I proved to be greatest attrition point, with 17.1% (n = 24) of the program Non-completers withdrawing or being dismissed from this course.
Reason for Withdrawal or Dismissal from School

After admission, if a student withdraws or is dismissed, the student self-reports the reason for withdrawal or dismissal. Following readmission, if a student withdraws or is dismissed from school, the process captures the reason for this second withdrawal or dismissal. When more than one factor is involved, the factor believed by the student to have the greatest impact on program departure is recorded for statistical purposes.

The results for the 140 program Non-completers indicated that the greatest factor was academic or clinical failure, with 77.9% (n = 109) as the primary reason for withdrawal or dismissal for the program. Personal or family issues at 8.5% (n =12) represented the second highest reason for program departure. Other self-reported factors included: regulatory issues (n = 7, 5%), financial reasons (n = 6, 4.3%) and health or pregnancy (n = 6, 4.3%) sharing the final ranking. Regulatory issues, while small in number, are practically significant in that they result in legal involvement or intervention that falls within the legal statutes enforced by the state board of nursing. If a student’s situation prevents their ability to receive approval to enroll, or continue, in clinical courses from the board of nursing, the school must remove them from the program until such time as approval is granted.

Objective 4

Objective four compared students who enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 and were Completers, having graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) with students who were Non-completers, because they withdrew or were dismissed and never graduated from the program on selected admission criteria noted below. The primary purpose in this comparison was to determine if there were statistically significant differences between the groups:
Completers and Non-completers, based on the program’s established admission criteria. A two-independent-samples $t$-test was conducted. The level of significance was set a priori at $\alpha = .05$.

**Nurse Entrance Test (NET®) Composite Percentile**

Analysis of the NET® Composite Percentile using the $t$-test revealed a difference in the means between the two groups: Completers ($M = 80.9$, $SD = 12.6$, $n = 330$) and Non-completers ($M = 76.7$, $SD = 14.1$, $n = 140$). With equal variances not assumed through Levene’s test, the $t$-test indicated the differences between the two groups was statistically significant, with an output of $t(237) = 3.007$, $p = .003$. This indicates that difference between the group means is greater than would be expected by chance.

**NET® Critical Thinking Scales**

Each of the NET® Critical Thinking Scales was examined individually for significance between the groups. The Main Idea of Passage for Completers showed ($M = 82.2$, $SD = 12.7$, $n = 330$), as compared to Non-completers with values of ($M = 79.2$, $SD = 15.0$, $n = 140$). As the smaller sample of the total student population used for the study, Non-completers showed both a lower mean score and greater variation among the scores. This difference was statistically significant, with equal variances not assumed using Levene’s test, the $t$-test indicated $t(227) = 2.052$, $p = .041$.

Inferential reading revealed group differences of: Completers ($M = 68.8$, $SD = 13.7$, $n = 330$), while Non-completers showed values of ($M = 65.3$, $SD = 14.4$, $n = 140$). These values also represented a significant difference, as $t(468) = 2.525$, $p = .012$.

Predicting outcomes posted the smallest mean differences between the groups and the lowest standard deviation. Reported values were: Completers ($M = 63.1$, $SD = 12.7$, $n = 330$) and Non-completers ($M = 61.4$, $SD = 11.2$, $n = 140$). This was the only critical thinking scale which did not demonstrate a statistically significant difference between the groups with actual values of $t(468) =$
1.354, \( p = .176 \). With the restriction in the range for all components and the closeness in scores for inferential reading, it is understandable that the difference may not be statistically significant.

**Calculated GPA for Required Prerequisite College Courses**

This calculated GPA represents the GPA for 25 hours of required general education college courses. The diploma program admission criteria require the calculated GPA to be 2.7 or higher. Data analysis revealed: Completers \((M = 3.15, SD = .32, n = 330)\) and Non-completers \((M = 3.06, SD = .30, n = 140)\). The results were determined to be statistically significant, with reported values of \(t(468) = 3.178, \ p = .002\).

**Program Predictive Grade Point Average (PGPA)**

The PGPA represents a calculation based on student’s earned grade in four specific prerequisite college courses and one other prerequisite course in which the student has the highest earned letter grade. The program does not specify a minimum value for the PGPA. However, a minimum letter grade of “C” is required for prerequisite courses. The comparison of mean PGPA for program Completers \((M = 3.24, SD = .34, n = 330)\) and Non-completers \((M = 3.12, SD = .34, n = 140)\). The results were determined to be statistically significant, with reported values of \(t(468) = 3.562, \ p = .000\); indicating the presence of a difference between the program Completers and Non-Completers.

**Objective 5**

Objective 5 was designed to compare students who were enrolled in a diploma nursing program in the southern United States between January 1998 and January 2008 who were Completers, having graduated from the program between December 1999 and December 2009 (or are projected to graduate in December 2010) and experienced interrupted study with students who were Non-completers, because they withdrew or were dismissed for a second failure after readmission and never graduated from the program on selected admission criteria included below.
Nurse Entrance Test (NET®) Composite Percentile

Analysis of the NET® Composite Percentile using the t-test revealed a difference in the means between two groups who each experienced interrupted study: Completers ($M = 77.7, SD = 13.5, n = 64$) and Non-completers ($M = 77.9, SD = 13.6, n = 41$). With equal variances not assumed through Levene’s Test, t-test indicated that the difference between the two groups was not statistically significant, with an output of $t(84) = .064, p = .949$. This indicates that difference between the group means is no greater than could be accounted for by chance.

NET® Critical Thinking Scales

Each of the NET® Critical Thinking Scales was examined individually for significance between the groups with interrupted study. The Main Idea of Passage for Completers showed ($M = 81.5, SD = 12.6, n = 64$), as compared to Non-completers with values of ($M = 77.5, SD = 15.9, n = 41$). This difference was not statistically significant, with equal variances not assumed using Levene’s test, the t-test indicated $t(71) = -1.346, p = .183$.

Inferential reading revealed group differences among those with interrupted study of: Completers ($M = 67.3, SD = 13.1, n = 64$), while Non-completers showed values of ($M = 63.9, SD = 12.9, n = 41$). These values also did not represent a statistically significant difference, as $t(103) = -1.326, p = .188$.

Predicting outcomes between the groups with interrupted study posted values of: Completers ($M = 63.2, SD = 12.2, n = 64$) and Non-completers ($M = 60.7, SD = 10.3, n = 41$). Again, this critical thinking scale did not demonstrate a statistically significant difference between the groups with interrupted study, with actual values of $t(103) = -1.054, p = .294$. With the restriction in the range for all components and the closeness in scores, it is understandable that the difference may not be statistically significant. This may also indicate that among students with interrupted study, critical
thinking may be less of a factor in success that personal factors. Additionally, there may be unidentified variables which contribute to the difference that are more significant than critical thinking skills.

**Prerequisite Grade Point Average (GPA)**

This calculated GPA represents the GPA for 25 hours of required general education college courses. The diploma program admission criteria require the calculated GPA to be 2.7 or higher. Data analysis for students with interrupted study revealed: Completers \((M = 3.00, SD = .28, n = 64)\) and Non-completers \((M = 2.96, SD = .23, n = 41)\). The results were not determined to be statistically significant, with reported values of \(t(103) = -.582, \ p = .396\).

**Program Predictive Grade Point Average (PGPA)**

The PGPA represents a calculation based on student’s earned grade in four specific prerequisite college courses and one other prerequisite course in which the student has the highest earned letter grade. The program does not specify a minimum value for the PGPA. However, a minimum letter grade of “C” is required for prerequisite courses. The comparison of mean PGPA among those who had interrupted study showed the program Completers with \((M = 3.12, SD = .32, n = 64)\) and Non-completers having \((M = 3.07, SD = .31, n = 41)\). The results were determined to lack statistical significance, with reported values of \(t(103) = -.714, \ p = .477\).

**Conclusions and Implications**

**Conclusion 1**

The diploma nursing program studied demonstrates a strong retention rate, as 70.2% \((n = 330)\) of enrolled students during the 11-year period analyzed were program graduates. Of concern, however is the discovery that once a student departs the program, 67% \((n = 94)\) of the 140 program Non-completers were not considered for readmission. There was only a small difference in those who
elected not to reapply \( (n = 53, 56.4\%) \) and those who were ineligible to reapply \( (n = 41, 43.6\%) \).

Nursing education programs represent a demanding course of study in all domains: cognitive, affective and psychomotor. Nursing students may require greater time to adjust to the rigor of nursing education and therefore, may leave the program after the initial courses. Thus the conclusion that as program departure by students will always occur, if the retention rate is to be improved, a greater number of the departing must begin to consider application for readmission.

**Conclusion 2**

Among students who applied for readmission, there was only a 4.5\% \( (n = 5) \) denial rate. Further, the retention rate for returning students was 61\% \( (n = 64) \). Therefore, the majority of students who chose to apply for readmission are able to return, but have a lower success rate that the general study body. The diploma nursing program should consider the at-risk status of returning students and plan interventions to promote student success according to assessed risk factors.

**Conclusion 3**

The curriculum design of a diploma nursing program and the pace of the program demonstrate the best retention when a student completes the course of study in a continuous format. 80.6\% \( (n = 266) \) of the graduates were successful in completing the program within the minimal time frame of 24 months. Each interruption in study, whether for academic or personal reasons such as pregnancy, increases the risk that a student will fail to complete the program. When more than one interruption is experienced, a learning contract may be considered with the student to include activities for completion during the lapse in enrollment, rather than simply upon return to the program.

**Conclusion 4**

The first term experience is a key to nursing student retention. Most nursing students left this diploma program within the first semester \( (n = 74, 53\%) \) having completed less than 25\% of the
program. Within the first year, 91.4% ($n = 128$) of attrition occurred. Transition into nursing school and integration of application based testing into the student learning experience are important elements in retention of nursing students. Although medical terminology is a component of the first semester courses, Pharmacology and fundamental nursing courses begin presenting information to students while they are developing language skills to understand the information. Further, as nursing is an applied discipline, evaluation through testing requires item-writing at the levels of comprehension, analysis and synthesis, rather than knowledge-based testing. Thus, students are tested on what they can understand and apply, rather than merely what they know. Additionally, as the entire program builds upon early information, knowledge must be retained and built upon from course to course. Many students arrive in the nursing program with a short-term memory style of test preparation. Early struggles may allow a student to successfully complete the foundational courses, but gaps in understanding will resurface in more advanced classes leading to attrition at the later point. The greatest factor associated with attrition is academic and/or clinical failure ($n = 109, 77.9\%$).

**Conclusion 5**

Analysis of admission criteria related to both standardized entrance testing using the NET® and various stratifications of GPA yielded statistically significant differences between the Completers and Non-completers of the diploma nursing program. The practical significance of this finding is that the combined use of GPA, PGPA and standardized testing provides a layering of information about the candidates for admission. Results of the study support the using similar assessments in admission consideration.

**Conclusion 6**

Although the NET® scores, GPA and PGPA are useful in consideration of applicants for admission, they were not statistically or practically significant factors in the retention of students who
experienced and interruption in their enrollment. Students with an interrupted course of study represent a greater risk to program attrition. Consideration of individual factors and variables may be important to retaining these at-risk returning students.

**Conclusion 7**

A component of attrition in a nursing program represents an appropriate method for determining the candidates with the ability and motivation to become successful nursing practitioners. Early nursing courses and those with a strong background in medical-surgical nursing topics are representative of the core concepts and activities of the registered nurse. Differential loss of students from these courses may represent natural selection for the nursing profession.

**Recommendations**

**Recommendation 1**

Consideration should be given to mechanisms to explore the reasons more departing students do not seek readmission to the diploma nursing program. An increase in the number of applications for readmission from group with early program departure, especially during the first semester could potentially improve the retention rate. If a student who has experience in the program can return and be successful, they may represent a more viable student candidate than an unknown applicant in the general applicant pool.

**Recommendation 2**

Seek opportunities to capitalize on the multigenerational learning environment. The diversity in age of the student population should be viewed as an asset to the diploma nursing program. The presence of traditional and non-traditional students allows for dialog about nursing care and health issues, as well as allows for creation of work teams to promote engagement and understanding by both groups.
**Recommendation 3**

Consideration should be given to developing marketing materials geared to the high school level that provide information about registered nursing as a career. This would promote high school student understanding of the role of the registered nurse and may create opportunities for job shadowing. It would allow for discussion regarding high school course choices important to support success at the college level. It would allow specific opportunity to reach males and minorities with information on how to begin the path to diploma nursing education through the community college or university systems.

**Recommendation 4**

Revisit the available secondary data to determine the extent to which single-parent households exist among nursing students in the diploma nursing program. As diploma nursing education represents a more rapid entry into the profession than baccalaureate nursing education, it may be more frequently selected as a program type by single parents or individuals desiring to expedite their path to employment and increased earnings. Consider potential social support or financial assistance opportunities that would promote retention and success among this group.

**Recommendation 5**

Design a “While You Are Out” style learning support system for students who will experience and interruption in their enrollment in the diploma program. Utilize social networking and technology as able to promote engagement and information technology skill building. Give attention to foundational concepts, including reinforcement of material such as anatomy and physiology that were contained in prerequisite college courses. Explore opportunities for presentation of supplementary programs or courses designed to develop study and preparation skills, promote critical thinking and improve confidence in decision making.
Recommendation 6

Establish an early intervention plan to identify and remediate first semester students prior to or immediately upon program entrance. Consider offering tutoring, discussion forums and similar programs to encourage student engagement with the material. Ensure nursing student body awareness of available employee assistance programs as needed for psychosocial issues or social support. Conduct open house or informational sessions for family members to increase their understanding of the expectations of the diploma nursing student. Explore curriculum redesign that would stagger early content to support student transition to the diploma nursing program learning environment.

Recommendation 7

The NET® test has been phased out by the diploma nursing program. This decision was secondary to a marketing shift by the testing company in favor of another product. With the adoption of the new required entrance test, the Test of Essential Academic Skills (TEAS-V®), consideration should be given to comparison of student results on each test. This will occur with students applying for readmission, as they will be required to complete the TEAS-V® and their NET® scores are already on file. Additionally, the program retains a quantity of NET® tests which will still be processed by the testing company. Upon selection of the class entering January 2011, enrolled students could have the NET® administered for comparison with the TEAS-V® utilized for their admission consideration. Comparison of the performance on the two tests will allow the diploma nursing program to examine the construct validity of the newly adopted standardized test instrument.

Recommendations for Further Research

Retention of nursing students, whether in a diploma nursing program or any other entry-into-practice program, will always be a many-faceted problem. With the diploma nursing program studied, it was validated that the Admissions and Selections Committee utilized appropriate admission criteria
to select applicants capable of success in the nursing program. One opportunity for further research would be to replicate the study in the associate degree setting and the upper division baccalaureate setting to see if the admission criteria utilized were significant factors in student retention. Although every program does not calculate GPA in the same manner or utilize the same entrance test, most programs use some combination of these factors. As nursing education programs look to future shortages of nurse educators and seek to accommodate as many potential nursing students as possible, there is discussion regarding centralized application systems for nursing school. This process would flow in a manner similar to law school or medical school admissions. Participating agencies would establish admission criteria and applicants would apply to a central board who would then match the applicants to the program based on the established criteria. Validation of the significance of admission criteria would be an important step in moving to such a centralized admission system.

As noted, the quantifiable variables used in this study of retention of nursing students in a diploma nursing program represents only a small portion of the retention picture. Significant information could be obtained through the use of qualitative methods or mixed methods of research to gain further knowledge and insight into this problem. While there are certainly opportunities to interview both Completers and Non-completers and information to be gained from each, a more significant group may be those students who are readmitted. What factors exist for those who are successful? Are they different than those who are unsuccessful? When someone wants to become a registered nurse, they may be as often acting on a calling or sense of purpose as they are on a career opportunity. For these individuals who seek this profession so strongly, a second failure in a nursing program is not only disheartening, but it can also be devastating. Many nursing education programs will not consider someone who has experienced two course failures in another program as candidates for admission. Therefore, the second failure may not only represent program attrition, but the end to a
personal dream. A qualitative research study may assist in the identification of indirect variables impacting the success of these individuals. Themes may emerge related to coping, stress, hardiness, resilience or any number of other concepts.

Retention within the nursing education program to prepare a graduate to successfully complete the NCLEX-RN examination and enter the practice of registered nursing is only the beginning of the link between nursing education and the potential to impact the nursing shortage. In order to address the critical need for RNs, the nursing graduates must also remain practicing RNs. Graduate surveys at intervals, such as five years, which collect follow-up data regarding the graduate’s continuation in nursing practice should be conducted. Survey questions should include human resource employment factors related to area of nursing practice, practice setting, pattern of employment and current career path. Additionally, information may be gathered regarding current or future education plans, certifications and professional achievements.

In addition to these direct retention factors for diploma nursing programs, research that examines student empathy, engagement and commitment would also support a richer understanding of why some nursing students persist and others withdraw. There is no fit-testing for registered nursing, although the practice of nursing is both an art and a science. Compassion for the human spirit is as important as technical skills. An enhanced understanding of factors significant in retention of nursing students may also assist in addressing retention of registered nurses in the practice environment.

Conclusion

This researcher has been a healthcare practitioner for 35 years, 31 of those years as a registered nurse. Over the decades healthcare has experienced great changes, both for better and for worse. The future holds greater change and uncertainty. The constant amid all of this chaos is the registered nurse. While responsibilities and scope of practice have changed, the purpose of the registered nurse has not –
to serve as the patient advocate – protecting them when they are vulnerable, comforting them when they are anxious, caring for them physically and spiritually, teaching, counseling, caring. Every patient deserves a registered nurse. The impending nursing shortage is a real threat, not merely an economic forecast. The ability to attract and retain nursing students is only one part of the strategy to insure that our patients have someone to nurture their spirit and care for their needs. It is a vital part of perpetuating the profession of registered nursing.
REFERENCES


Klestzick, K. R. (2005, December 9). Despite encouraging trends suggested by the NLN's comprehensive survey of all nursing programs, large number of qualified applications continue to be turned down. New York: National League for Nursing.


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APPENDIX A

LSU INSTITUTIONAL REVIEW BOARD
APPROVAL FOR EXEMPTION FROM INSTITUTIONAL OVERSIGHT

Application for Exemption from Institutional Oversight

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/projects using living humans as subjects, or samples or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This form helps the PI determine if a project may be exempted, and is used to request an exemption.

➢ Applicant, Please fill out the application in its entirety and include the completed application as well as parts A-E, listed below, when submitting to the IRB. Once the application is completed, please submit two copies of the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at http://www.lsu.edu/irb/screeningmembers.shtml

➢ A Complete Application Includes All of the Following:
(A) Two copies of this completed form and two copies of parts B thru E.
(B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1 & 2)
(C) Copies of all instruments to be used.
• If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.
(D) The consent form that you will use in the study (see part 3 for more information.)
(E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB.

Training link: (http://php.nihtraining.com/users/login.php.)

1) Principal Investigator: Carol A. Tingle Ph.D candidate
Dept: HRE Ph: 225-931-6063 E-mail: tingle@lsu.edu

2) Co Investigator(s): please include department, rank, phone and e-mail for each
• If student, please identify and name supervising professor in this space

Dr. Kristianna Machte, Ph.D
Associate Professor
School of Human Resource Education
225-579-7644 Office
machte@lsu.edu

3) Project Title:
Retention of Students in a Diploma Nursing Program in the Southern United States

4) LSU Proposal? (yes or no) No If Yes, LSU Proposal Number
Also, if YES, either
☐ This application completely matches the scope of work in the grant
☐ More IRB Applications will be filed later

5) Subject pool (e.g. Psychology Students)
Nursing students
• Circle any “vulnerable populations” to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature Carol A. Tingle ** Date 10/18/09 (no per signatures)
“I certify my responses are accurate and complete. If the project scope or design is later changed I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Action: Exempted ✓ Not Exempted Category/Paragraph 4

Reviewer: Mathews Signature New Mathews Date 12/15/07

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# APPENDIX B

## SAMPLE DATA COLLECTION SPREADSHEET

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</tr>
<tr>
<td>W</td>
<td>Asian</td>
</tr>
<tr>
<td>X</td>
<td>Other</td>
</tr>
<tr>
<td>Y</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ID</th>
<th>Year</th>
<th>Gender</th>
<th>Race</th>
<th>GPA</th>
<th>AP</th>
<th>SAT</th>
<th>WGS</th>
<th>GPA</th>
<th>SigPi</th>
<th>Status</th>
<th>Course</th>
<th>Time of WD</th>
<th>Reason for WD</th>
<th>Semester</th>
<th>Withdrawn</th>
<th>Enrollment</th>
<th>Male</th>
<th>Female</th>
<th>White</th>
<th>Black</th>
<th>Hispanic</th>
<th>Asian</th>
<th>Other</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1988</td>
<td>M</td>
<td>W</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>F</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
</tbody>
</table>
APPENDIX C

ADMISSION AND COMPLETION DATA COLLECTION CODING NOTES

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID #</td>
<td>Last two digits of year entered program, followed by unique sequential identifier</td>
</tr>
<tr>
<td>Year Entered</td>
<td>4-digit number represents year student entered the program</td>
</tr>
<tr>
<td>Year Graduated</td>
<td>4-digit number represents year graduated</td>
</tr>
<tr>
<td></td>
<td>99 = Not applicable, did not graduate (DNG)</td>
</tr>
<tr>
<td>Data with Actual Values, Not coded</td>
<td>NET Comp: NET Composite Percentile</td>
</tr>
<tr>
<td></td>
<td>MIP: Main Idea of Passage</td>
</tr>
<tr>
<td></td>
<td>IR: Inferential Reading</td>
</tr>
<tr>
<td></td>
<td>PO: Predicting Outcomes</td>
</tr>
<tr>
<td></td>
<td>GPA: Grade Point Average</td>
</tr>
<tr>
<td></td>
<td>5GPA: GPA for 5 program designated courses</td>
</tr>
<tr>
<td></td>
<td>Age: Calculated in years based on DOB</td>
</tr>
<tr>
<td>Gender</td>
<td>1 = Female</td>
</tr>
<tr>
<td></td>
<td>2 = Male</td>
</tr>
<tr>
<td>Race</td>
<td>1 = Asian</td>
</tr>
<tr>
<td></td>
<td>2 = Black or African American</td>
</tr>
<tr>
<td></td>
<td>3 = Hispanic/Latino</td>
</tr>
<tr>
<td></td>
<td>4 = Native Hawaiian/Pacific Islander</td>
</tr>
<tr>
<td></td>
<td>5 = Caucasian or White</td>
</tr>
<tr>
<td>Marital Status</td>
<td>(at entry and graduation or withdrawal)</td>
</tr>
<tr>
<td></td>
<td>1 = Single</td>
</tr>
<tr>
<td></td>
<td>2 = Married</td>
</tr>
<tr>
<td></td>
<td>3 = Divorced</td>
</tr>
<tr>
<td># Children</td>
<td>Value equals number of children</td>
</tr>
<tr>
<td></td>
<td>0 = No</td>
</tr>
<tr>
<td>Pregnant during enrollment (student or spouse)</td>
<td>1 = No</td>
</tr>
<tr>
<td></td>
<td>2 = Yes</td>
</tr>
</tbody>
</table>

108
Completion Status
1 = Graduated, 24 months
2 = Graduated, 36 months
3 = Graduated, 48 months
4 = Graduation pending, 2010
5 = Did not graduate (DNG) – Ineligible to reapply
6 = Did not graduate (DNG) – Did not reapply (DNR)
7 = Did not graduate (DNG) – Readmission denied
8 = Did not graduate (DNG) – 2nd Academic/Clinical Failure

Did Not Reapply (DNR) Reasons
1 = Changed programs
2 = Changed career
3 = Relocation
4 = Personal/family issues
5 = Financial reasons
6 = Regulatory issues
99 = Not applicable/Uninterrupted study

Semester Withdrew
1 = Spring semester of year entered
2 = Summer term of year entered
3 = Fall semester of year entered
4 = Spring semester 2nd year
5 = Fall semester 2nd year
99 = Not applicable/Uninterrupted study

Reason for Withdrawal
1 = Academic/clinical failure
2 = Personal or family issues
3 = Health or pregnancy
4 = Financial reasons
5 = Regulatory issues
99 = Not applicable/Uninterrupted study

Enrolled Course at time of Withdrawal
1 = Nursing 110: Pharmacology in Nursing
2 = Nursing 112: Introduction to Nursing I
3 = Nursing 110 and Nursing 112, if student unsuccessful in both courses
4 = Nursing 120: Introduction to Nursing II
5 = Nursing 220: Nursing of Adults I
6 = Nursing 221: Nursing of Adults II
7 = Nursing 224: Child and Mental Health Nursing I
8 = Nursing 225: Child and Mental Health Nursing II
9 = Nursing 320: Maternal-Newborn Nursing
<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Nursing 322: Management in Nursing</td>
</tr>
<tr>
<td>99</td>
<td>Not applicable/Uninterrupted study</td>
</tr>
</tbody>
</table>

**Reason for Withdrawal after Readmission**
- 1 = Academic/clinical failure
- 2 = Personal or family issues
- 3 = Health or pregnancy
- 4 = Financial reasons
- 5 = Regulatory issues
- 99 = Not applicable/Uninterrupted study

**Re-entry Completion Status**
- 1 = Graduated
- 2 = Did not graduate (DNG)
- 3 = Graduation pending, 2010

**Enrolled Course at Time of Dismissal (2nd Academic or Clinical Failure)**
- 1 = Nursing 110: Pharmacology in Nursing
- 2 = Nursing 112: Introduction to Nursing I
- 3 = Nursing 110 and Nursing 112, if student unsuccessful in both courses
- 4 = Nursing 120: Introduction to Nursing II
- 5 = Nursing 220: Nursing of Adults I
- 6 = Nursing 221: Nursing of Adults II
- 7 = Nursing 224: Child and Mental Health Nursing I
- 8 = Nursing 225: Child and Mental Health Nursing II
- 9 = Nursing 320: Maternal-Newborn Nursing
- 10 = Nursing 322: Management in Nursing
- 99 = Not applicable/Uninterrupted study
VITA

Carol Ann Tingle is a native and resident of Baton Rouge, Louisiana. She is the seventh of 10 children born to Charles and Irene Tingle. As a child, she attended elementary school and junior high in Baker, Louisiana, and was an honor graduate of Baker High School in 1975. Following high school graduation, Carol worked as a nursing assistant at Lane Memorial Hospital in Zachary, Louisiana, while awaiting the beginning of the fall semester to leave for college. Attending the University of Southwestern Louisiana in Lafayette beginning in August of 1975, she began formal education for her career as a registered nurse. Carol received a Bachelor of Science in Nursing in May of 1979. She began her career as an RN in the family business at Our Lady of the Lake Regional Medical Center (OLOL). Her mother, Irene and two of her sisters were operating room nurses at Our Lady of the Lake already; a younger sister would join the RN team later. As a RN in the operating room at OLOL since the 1960s, Irene served as a role model and mentor for four of her daughters who are RNs today. There was no doubt about the hard work of being a nurse or about the rewards this life of service to mankind would bring.

While at OLOL, Carol practiced nursing primarily in the Post Anesthesia Care Unit (PACU) where she was a charter member of the Louisiana Post-Anesthesia Nurses and was the first certified Post-Anesthesia Nurse in Louisiana. In 1988, she became Nurse Manager of a 48-bed Cardiovascular and Thoracic Surgery unit which later absorbed other clinical services. During this time, Southeastern Louisiana University announced the opening of a Master of Science in Nursing program in conjunction with an Intercollegiate Consortium formed with three other state universities using National Institutes of Health grant funding. Carol was the first student to enroll in the master’s program, spending hours with Dr. Carole Holden-Lund to test the new process.
While completing her MSN, she became the Assistant Director of Nursing at OLOL with responsibility for developing Nurse Managers, budgeting for the Nursing Departments, Staffing and Acuity systems and the implementation of the first clinical computer documentation system at OLOL. Ironically, implementation of the computer system resulted in her mother’s retirement, citing she became a nurse to interact with patients, not computers.

While concluding her MSN degree, Carol was recruited to the faculty at Baton Rouge General Medical Center School of Nursing. Carol was awarded her degree from Southeastern in May 1996. As a faculty member at “the General” she began her educator role teaching Mental Health at the junior-senior level, later teaching Pediatrics, and participating in Nursing of Adults and Management in Nursing; eventually participating in every course except Maternal-Newborn nursing. Following the early retirement of the program founder, Mrs. Laura Thigpen, Carol began her role as Director of the School of Nursing on January 1, 2000. The role has brought many challenges and rewards and has allowed Carol to work with a tremendous group of professional nurses who serve in faculty roles at the School of Nursing.

One personal challenge and reward has been the work toward this doctorate. From the first class with Dr. Earl Johnson, it was evident that the program was a good match for Carol’s role and goals. All of the faculty and staff in the Human Resources Education Department have been wonderful sources of support and mentorship.

Carol continues her career as a RN; maintaining an active role in professional organizations such as the American Nurses Association, Louisiana State Nurses Association (Workplace Advocacy Consultant), Baton Rouge District Nurses Association, National League for Nursing, Sigma Theta Tau International, Louisiana Council of Administrators of Nursing Education, and Greater Baton Rouge
Nursing Educator Consortium as chairperson of the Area RN Programs Long-range Planning Committee. She has received numerous awards and honors throughout her 31 year nursing career.