FACTORS INFLUENCING ACADEMIC SUCCESS

AMONG NURSE ANESTHESIA STUDENTS

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DEDICATION

For the Lord Jesus, for giving me this life which I do not deserve. To You be the Glory!

For my parents, Papa Tomas, and Mama Fila, for love. I miss you always.

For my partner, Rick, who provides me with inspiration, guidance, love, and support. What a journey. Thanks for being there all the way.

For my students, you were the reason why I love this job. Thank you for making me who I am today.

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"Yes!" Thank you. Indeed, you are part of the reasons why I ventured in this long

journey.

ABSTRACT

TITO D. TUBOG

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The admission process to nurse anesthesia (NA) programs is very rigorous.

Students enrolled in NA education are academically and experientially prepared for

graduate work. However, some students are not academically successful in the didactic

learning phase of the program. There is limited research on academic success in the

didactic learning phase of the NA program. There is a need to learn about academic

success from the perspectives of students who have successfully passed the didactic

learning phrase. To better understand the students' views on the factors influencing

academic success in the didactic learning phase of the NA curriculum, a qualitative

descriptive research design was conducted.

A total of 14 participants were included in this study. All participants are students

enrolled for at least 18 months in a nurse anesthesia school. A semi-structured interview

questionnaire was used to gather data. The method proposed by Graneheim and Lundman

was used for content analysis. Six themes emerged from the data analysis. The data

showed factors that influenced academic success during the didactic portion of the NA

education: (1) utilization of effective study strategies and methodology, (2) transition to

deep learning behaviors, (3) integration of learning styles and technology, (4)

consideration of individual teachers, (5) staying connected and (6) adjusting to being a

NA student.

These findings may be used for educators, NA leadership, and institutions offering

NA education. Academic success is influenced by a combination of cognitive,

noncognitive, and sociodemographic factors. In the didactic phase of NA education,

noncognitive factors have shown to be a driver to the academic performance of t students.

The findings of this study added new dimensions and perspectives to the body of research

in NA education. The findings have implications for nurse anesthesia education, policy,

practice, and future studies. Stakeholders involved in students' academic success during

the didactic phase of the NA curriculum may develop plans to address factors

contributing to academic success to assist students in their academic journey.

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CHAPTER I

INTRODUCTION

The United States healthcare system has undergone a series of structural changes, reshaping provision of care to its people. With much focus on patient-centered care, healthcare reforms empower healthcare administrators, providers, and policymakers to improve access to patient care without worsening the current healthcare system (Berwick et al., 2008; Epstein & Street, 2011; Panny et al., 2019; Rickert, 2012; Vincensi, 2019). The need to increase access to care was embodied in the Institute of Medicine (IOM) report, *The Future of Nursing: Leading Change, Advancing Health*, reinforcing the expansion of the role of nurses in the U.S. healthcare system to meet the growing demand for healthcare services (Heller et al., 2000; Institue of Medicine, 2011). Two of the IOM report's primary issues under considerations were roles of nurses in the current healthcare system and nursing education and training. The report recommended the full extent of practice for nurses to be based on advanced education and training, and empowered nurses to lead healthcare change in various settings. Subsequently, the IOM emphatically urged policymakers to remove barriers that hinder nurses, including advanced practice registered nurses (APRN), from practicing to the full extent of their education and training (Heller et al., 2000). Simultaneously, the IOM's message transformed nursing education to meet the vision of changing nurses' roles and responsibilities.

The Council on Accreditation (COA) of Nurse Anesthesia Educational Programs, the accrediting body of nurse anesthesia (NA) education, met the IOM's call by ensuring that academic institutions prepare NA students to meet diverse needs of patients, assume a leadership role in healthcare, and advance the science to deliver quality care that will benefit patients and communities (COA, 2019). With all NA programs transitioning to a clinical doctorate in 2022, the American Association of Nurse Anesthesiologists (AANA) and COA are fulfilling the IOM recommendations, which include preparation of competent anesthesia providers and creation of a nursing partnership with other healthcare disciplines to redesign an effective delivery of healthcare and improve the workforce in the US (COA, 2019).

More than a decade after the IOM report's publication, anesthesia care and services demand are exponentially growing. A report released by the Health Resources and Services Administration (HRSA, 2017) on the future of nursing workforce projected growth in the number of Certified Registered Nurse Anesthesiologists (CRNA) jobs by 2030. Along with growing needs of anesthesia services, HRSA (2017) projected that the number of CRNAs would be significantly low. To meet these needs, NA education has grown into a sizable presence in graduate education (COA, 2019), and the number of schools and students are expected to grow further due to healthcare organizations seeking graduates with higher credentials for entry-level practice. For NA programs to best prepare students for the healthcare workforce, research is needed to examine factors that

influence academic success. Examining factors affecting the success of NA students in their academic journey, may minimize the rate of unsuccessful students without compromising the quality of NA education and subsequently address concerns regarding shortages of CRNAs in the country (HRSA, 2017).

Focus of Inquiry

For students to become CRNAs, students must successfully manage the academic rigors of NA education and pass the national certification examination (NCE). Academic success, also termed student success, academic achievement, or student retention (York et al., 2015), is one of the most widely used constructs in educational and assessment research within higher education. Despite the widespread use of this construct, the definition of academic success varies by individual, academic institution, or researcher. For example, academic success may be understood as a student's progression from one phase of training to another training phase. Burns (2011) defined academic success in NA education as completing didactic and clinical training instead of solely maintaining an academic achievement during the didactic portion of the curriculum. In another study, academic success was measured to improve retention and graduation rates (Conner, 2015). Similarly, academic success can be defined as acquiring skills and competence, persistence, and career success (Galyon et al., 2011; Ng et al., 2005; Pascarella & Terenzini, 1980; Plant et al., 2005; Tracey et al., 2012).

The variability in the definition of academic success means that outcome measures in research studies also differ. There are various ways of assessing and evaluating academic success based on operationalization of the construct in the literature. The most common student outcomes used to measure academic success are with the grade point average (GPA; York et al., 2015). Some studies have used examination grades and standardized examination scores to measure academic success (Pascarella & Terenzini, 1980; Plant et al., 2005; Tracey et al., 2012; York et al., 2015). With multiple and discipline-specific definitions of academic success, the generalization of research findings is seemingly limited, localized, and restrictive. Most of the studies in NA students, for instance, have focused on master-level students at a single institution or regional areas, limiting the application of findings to NA students in the doctoral programs or the entire country.

Perhaps the broadest definition of academic success was derived from Kuh et al. (2006). Educational researchers defined academic success as "academic achievement, engagement in educationally purposeful activities, satisfaction, acquisition of desired knowledge, skills and competencies, persistence, attainment of educational outcomes, and post-college performance" (Kuh et al., 2006, p. 5). Kuh et al. highlighted a multidimensional meaning of academic success yet focused on cognitive and noncognitive components. An updated definition of academic success amended the previous definition by naming six significant components of success: "Academic

achievement, satisfaction, acquisition of skills and competencies, persistence, attainment of learning objectives, and career success" (York et al., 2015, p. 4). The idea that academic success is not determined by a single factor, but rather a combination of factors, challenges students and educators to understand these determinants to achieve academic success.

In NA education, research studies examining factors influencing academic success are limited; in particular, evidence representing viewpoints and experiences from students is scarce. Published research on academic success in NA consists mostly of quantitative studies examining correlation of admission criteria and progression and completion of the NA program, overlooking the variables and factors affecting student success after admission to the NA program (Burns, 2011; Collins, 2013; Dosch et al., 2008; Hulse et al., 2007). Recent studies evaluating academic success factors after admission to NA schools focused mostly on resiliency, strategies to reduce stress, support system, and self-efficacy (Conner, 2015; Imus et al., 2017; Wilson et al., 2015). Furthermore, there are limited published studies examining factors during the didactic learning phase of the training (Burns, 2011; Hulse et al., 2007; Wilson et al., 2015). Hence, there is a need to better understand the student's experiences and perspective of factors influencing academic success during matriculation specifically the didactic portion of the curriculum.

Didactic learning and clinical training are two phases of NA education. In some schools, didactic and clinical training are integrated in which both learning and training happen simultaneously. In an *integrated* NA curriculum format, didactic courses are given while the students are in the clinical training. The clinical training phase in an integrated program often commenced in the second semester of the curriculum. In others, the NA program is *front-loaded* with the didactic phase administered in the beginning of the curriculum lasting for the first 12–16 months and the clinical phase for the following 20–24 months. Although there are anesthesia and non-anesthesia classes concurrent with clinical training, most of the didactic courses in the *front–loaded* programs were offered in the first portion of the curriculum. A commonly adopted didactic curriculum across NA programs integrates scientific principles of anesthesia theory and practice, consisting of advanced courses in biochemistry, physics, pharmacology, anatomy and physiology, anesthesia principles, and other non-anesthesia courses (COA, 2019). Successful completion of didactic learning is vital because it sets the scientific underpinnings of anesthesia principles and prepares students to understand and execute psychomotor and affective skills in the clinical anesthesia settings during clinical training (Henrichs & Thompson, 2009).

Students in the NA programs are highly motivated. Besides the competitive admission requirements, previous academic and experiential background influenced the student's academic performance in didactic learning (Imus et al., 2017). With NA

education lasting at least 3 years of full-time study, the financial burden also pushes students to be successful (Imus et al., 2017). Once the students begin the program, the same resources and support systems are available to all students at their respective institutions. All NA students are exposed to the same curricular rigors, such as excessive workload, information overload, and extensive training. Nevertheless, academic performance differs between those students who can manage these challenging curricula effectively and those who cannot (Burns, 2011; Collins, 2013; Dosch et al., 2008; Hulse et al., 2007; Wilson et al., 2015).

The literature and the current state of NA education suggest a need to better understand the students' experiences on how to succeed in NA education's didactic learning. Because successfully passing the didactic learning is crucial in being successful in the NA program, it is critical to understand students' experiences who have completed the didactic learning portion. Once the experiences of students who successfully passed the didactic phase are explored, the findings can be adopted by incoming NA students to improve academic performance, guide NA educators in strategizing student advising and remediation, and allow institutions to revisit and review admission criteria.

Definition of Terms

The following terminologies were identified and defined to establish alignment, consistency, transparency, and interconnection between the concepts within the study.

Didactic course: These are courses offered during the didactic learning phase of an NA program. These courses include advanced courses in biochemistry, physics, pharmacology, anatomy and physiology, basic and advanced anesthesia principles, and other non-anesthesia courses.

Didactic learning phase: The didactic learning phase in NA programs refers to the non-clinical component of the NA program.

Front-loaded programs: In this type of NA program, most of the non-clinical components are offered before students enter in the clinical training phase. In some programs, it is offered in the first 12 or 16 months after admission to NA school.

Integrated programs**:** The integrated curriculum administers a combination of non-clinical courses and clinical training simultaneously in the entire program.

Problem of Study

The AANA adopted the recommendation of the American Association of Colleges of Nursing for Doctor of Nursing Practice as a terminal degree for APRNs, including NAs. The educational rigor associated with doctoral education reinforced the importance of exploring factors influencing NA students' academic success. Admission to NA programs is competitive, with over 17,000 applicants in 2019, and only a 20% acceptance rate nationwide (AANA, 2019). The program admission selection criteria differ by school. In all 128 NA schools in the country, the most common requirements include the undergraduate GPA, science GPA, the scores of each section of Graduate

Records Examination (GRE), critical care experience, interview scores, emotional intelligence assessment data, and grit. Emotional intelligence is the ability of the individual to manage emotions and the emotions of others (Donthi, 2012). On the other hand, grit is an individual's perseverance to achieve a goal (Bouffard, 2017). All nurses enrolled in the NA programs meet most of these requirements. However, the attrition rates of NA students vary with the latest data showing the average rate at 6% in 2019 nationwide (AANA, 2019). For this reason, NA educators are interested in understanding the causes of academic performance discrepancies (Burns, 2011; Ortega et al., 2013). As a result, every year, educators are faced with the task of identifying factors affecting performance in high-stakes exams and the overall performance in graduate education.

The academic failure of these seemingly qualified students requires attention from educators. A review of the literature in all educational levels suggested that a wide variety of factors affecting success can be categorized as cognitive and noncognitive determinants (Cerna & Pavliushchenko, 2015; Crede & Kuncell, 2008; Imus et al., 2017; Jafari et al., 2019; Steinmayr et al., 2019; Yokoyama, 2019). The literature review also yielded a wide variety of cognitive, noncognitive, and social-demographical determinants that predict academic success, mostly in non-anesthesia programs. Aside from sparse data on the correlation between cognitive and social-demographic factors and progression in the NA program, most of the NA education studies evaluated the preadmission variables and not the variables that may impact academic success once the students are admitted

into the program. The available literature both at the college and graduate levels—studies on cognitive, noncognitive, and social-demographical factors—reported conflicting results, with the cognitive factors as the most used variable in many studies. Although cognitive factors may improve academic success, many educators shift their focus and investigate student success's noncognitive determinants (Crede & Kuncell, 2008).

Research Question

The study sought to answer the research question: What factors influence academic success in NA education during the didactic learning phase of the NA program? This study explored students' views on what factors contributed to their success during the didactic learning phase of an NA program. Students who have been successful in the didactic learning phase of the NA program can speak from their expriences. A better understanding of these academic success factors after enrollment in the NA program will help NA educators identify early students at risk of failure during the didactic learning and address strategies for academic success. In addition, knowledge of these factors will promote program progression and improve student retention. Furthermore, the perspectives of those who are successful during the didactic learning will provide insights into the adult learner, particularly individuals who are academically and experientially prepared, and on strategies to support students and improve academic performance in NA education by individual counseling, remedial actions, and other appropriate interventions.

Rationale for the Study

CRNAs administer 49 million anesthetics every year in various surgical settings (AANA, 2019). CRNAs are the sole anesthesia providers in rural areas and medically underserved communities (AANA, 2019). As APRNs, CRNAs can practice to the full extent of their education and training. As an independent provider and highly skilled specialist, a CRNA has a tremendous responsibility in managing surgical patients under anesthesia in a collaborative setting (AANA, 2019). The prediction of the supply and demand of CRNAs is confounded with the variability of the anesthesia practice arrangement. In a 2010 RAND study, the authors predicted a surplus of CRNAs in 2020 (Daugherty et al., 2010). However, the latest survey suggested that the demand for CRNAs will expand because of the aging population, an increase in the number of outpatient surgeries, and cost-effectiveness strategies in the healthcare system (HRSA, 2017). With a potential increase in demand for anesthesia services in the country, understanding factors impacting academic success will assist programs in producing qualified CRNAs ready to fill the workforce.

Another reason for the need to explore factors that influence academic success in NA students is the moderately high attrition rate. Educators are one of the gatekeepers of the NA profession, and maintain the quality of NA education. Matriculated students are highly skilled critical nurses and academically prepared students yet, on average, the attrition rate fluctuates between 6% to 9% nationally, with some schools reporting

attrition rates of >20% (AANA, 2019). The causes affecting the attrition rate are multifactorial. In a study conducted by Wilson et al. (2015), these factors include personal illness, family illness, other problems, motivation, and academic dismissal. Other reported causes of attrition rate included voluntary and clinical dismissal (Burns, 2011; Collins, 2013).

When an NA student is unsuccessful in an NA school, the financial burden is exceedingly high. A report from the AANA's 2016 Financial Planning showed an average cost of $120,000 for the entire NA program (AANA, 2019). These figures do not include living expenses, net income forgone, and other university and professional fees. In addition, when a student does not complete the NA program, the vacated position cannot be filled, which is a loss to another qualified student who may have been capable of completing the program. The overall impact of attrition from the NA program contributes significantly to student debt and the high cost of education and reduces the supply of CRNAs.

Finally, there is a shortage of studies examining factors the NA students experienced during the didactic learning phase influencing academic success. Published studies address the common predictors of academic success, such as the undergraduate and science GPA, the number of years in Intensive Care Unit (ICU), gender, age, and GRE scores (Burns, 2011; Dosch et al., 2008). These studies addressed noncognitive factors such as anxiety, locus of control, and emotional intelligence (Collins, 2013;

Conner, 2015). These studies evaluated the variables and factors as admission criteria, which may be significant for NA students and educators to ensure success during matriculation, specifically during didactic learning.

Philosophical Underpinnings

There are many strategies to improve students' academic performance in NA education, yet despite the widespread use of these approaches, there is a concern that the number of unsuccessful students is substantial, considering the rigorous admission processes in place. The literature is scant concerning the predictive and correlational variables and factors associated with academic success in NA education, specifically during the didactic learning phase of the NA program. Because most studies examined the predictive properties of preadmission data, exploring student's experiences may shed some insights and provide a better understanding of the very nature of factors affecting academic performance in NA education. Thus, the philosophical framework guiding this study is the postpositivism paradigm.

A paradigm informs the design of the study. Guba and Lincoln (1994) described the three building blocks that characterize a paradigm: ontology, epistemology, and methodology. Reflecting on what constitutes reality or the nature of reality allows the researcher to choose a paradigm within their understanding of reality. Postpositivism evolved from positivism as an extension, adaption, and development of positivistic ideas. Postpositivism is not an outright rejection of positivism but rather a critique of positivist

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epistemology and ontology. The postpositivist's understanding of reality is that reality exists and can be identified. Postpositivism accepts the limitation of human intellectual mechanisms in observing and capturing the phenomena because the truth is understood in different ways and the nature of phenomena is fundamentally intractable (Guba & Lincoln, 1994; Letourneau & Allen, 1999; Ryan, 2006). In other words, postpositivism supports multiple versions of reality with limitations in accurately capturing them, unlike the positivist paradigm of inquiry. The researcher seeks one truth that can be measured, quantified, and categorized via the scientific method. Truth is viewed by positivism as a certainty, while postpositivism views truth cautiously. What is real depends on the meanings attached to the truth. Since reality is based on how we see things, the truth evolves and changes depending on experiences. Since reality is also context-bound, it cannot be generalized. It can only be transferred to a similar context or situation.

The nature of reality dictates the relationship between the researcher and the research study. In postpositivism, an emic perspective allows the researcher to interact with study participants to understand the meanings of the participants' experiences. The one-sided mirror view is mostly abandoned due to the impossibility of maintaining such a perspective. What is accepted is that researchers are located within the world where the researcher is conducting the study. Nevertheless, analyses are guided by the study participants' social, historical, and personal experiences and the study researcher. In postpositivism, the researcher builds an approximation, though not a complete, truthful

picture, of the research object. The researcher is a data collection instrument and is part of the research. Postpositivism adopts the objectivist position when it comes to acquisition and justification of knowledge. The postpositivist research methods are objective and require accuracy using other forms of instruments such as self-reports, interviews, and questionnaires as tools to assist the researcher's ability to infer the truth.

The methodology informed by postpositivism considers the fallibility of the measurements. Therefore, the ideal methodology should include the process of "critical multiplism" where a variety of different observation and measurement tools are used in concert to approximate reality. Reviewing data from various sources during research allows the researcher to identify the sources of errors and control them. Falsifiability, a term coined by Karl Popper, switched the philosophy of science from positive proof to the idea that scientific theories cannot be confirmed but only falsified (Ernest, 1994). The central tenet is that theories cannot obtain the real truth; instead, the findings are closer to the truth. Hence, the research is subject to provide comprehensive explanations of methods and clarify how the researcher concluded.

Under the umbrella of postpositivism one finds the paradigm of naturalism. Like that of postpositivm, naturalism assumes that the nature of reality cannot be proven or unproven (Guba, 1990). Realities are multiple constructions in naturalistic paradigm, which lies in contradiction to the positivist mindset of the existence of one truth (Guba, 1990). Truth, to be understood, cannot be studied in a silo but should be examined in

context as experienced by the individual. The relationship between the *knower* and *what is known* suggests that each is inseparable (Lincoln & Guba, 1985). The researcher becomes an intangible part of the research as a human instrument during the data collection and embraces a transactional approach to examine the phenomenon. The generalizability of the findings of the study is subject to time and situation. Unlike positivism which maintains causal linkages, naturalism offers substantial description of the phenomenon allowing the transferability findings dependent on time and context.

Theoretical Framework

To understand factors including academic success of NA students during the didactic learning phase of their NA education, it is imperative that the researcher understands how the students learn in this setting. Malcolm Knowles' adult learning theory provided some background theoretical understanding for this study (Knowles, 1974, 1984; Knowles et al., 2005). Knowles (1970), in his seminal work *The Modern Practice of Adult Education: From Pedagogy to Andragogy*, coined the term andragogy to define how adult students learn. Adult learners are sometimes referred to as non-traditional and/or mature students aged 24–64 years (Justice & Dornan, 2001). Knowles theorized that adults' learning approaches differed from children and developed five assumptions that explain the differences.

1. Autonomy and self-direction: Mature students assess their own learning needs and can identify learning resources to implement appropriate learning strategies.

2. Experience: Students come with experiences from the field that are useful for learning.

3. Readiness to learn: Mature students are ready to learn skills beneficial for their growth.

4. Goal-orientation: Students are focused on achieving a career goal for self-improvement and self-actualization.

5. Motivation: As an individual matures and gains life experiences, the motivation to learn is more internal rather than external.

Knowles's theory only provided theoretical framework to understand the background knowledge. This background knowledge includes the following: The NA students come with varied academic and clinical experiences and are highly motivated to learn (Imus et al., 2017). Students in the NA program are professional nurses who bring critical care knowledge and experiences suitable for highly skilled practitioners in the learning environment. The NA students are self-directed in their learning process, enabling them to diagnose their own learning needs, assess the learning environment, develop, and adjust study skills and habits, and evaluate their learning outcomes.

Nonetheless, the philosophical underpinnings of postpositivism informed the choice of the methdology for this study.

Chapter Summary

The projected increase in the demand for anesthesia services and professional anesthesia shortage, rigors of clinical doctorate curriculum, concerning attrition rate, and lack of understanding of factors influencing academic success in NA education during matriculation strongly suggest the need to conduct a qualitative descriptive study on factors affecting academic success in NA education. Understanding factors that either positively or negatively impact academic success during matriculation, specifically during the didactic learning phase, will assist programs to develop and create counseling services and support systems during the didactic learning phase. Subsequently, by improving retention and reducing attrition rate, NA programs can graduate competent and highly skilled anesthesia professionals to fill a vacancy, especially in medically underserved communities and rural settings.

CHAPTER II

REVIEW OF LITERATURE

Previous education and social science research primarily operationalized academic success using GPA, and standardized exam performance and exam scores (Alyahyan & Düştegör, 2020). Although these outcomes are used universally, they are not a comprehensive representation of the student's abilities and experiences, nor necessarily indicative of a successful or unsuccessful academic journey. Academic success, defined as progression and completion of an academic journey, involves an array of multidimensional and complex factors, roughly divided into cognitive and noncognitive variables (Crede & Kuncell, 2008), as well as social and demographic factors (Burns, 2011; Pirmohamed et al., 2017; Rodríguez-Hernándeza et al., 2020; Voyer & Voyer, 2014).

In most of the nursing studies in the literature, the nursing undergraduate program's GPA is a commonly identified predictive factor of student academic achievement in higher education (Hinderer et al., 2014; Kowitlawakul et al., 2013; Manieri et al., 2015; Timer & Clauson, 2011). Nonetheless, relying on GPA to measure intellectual abilities is misleading as other measures determine a person's success. Hannon (2014) argued that GPA, a major cognitive factor component, only accounted for 19% of the variance explaining academic success in first-year undergraduate students,

and standardized examinations only explained 10%. The implication of Hannon's findings shapes the dynamic discussion that other factors, such as noncognitive and social-demographic determinants, play a significant role in success after admission in the graduate school setting.

The interactions of cognitive, noncognitive, and social-demographic factors impacting academic success are depicted in Figure 1. Cognitive, noncognitive, and social-demographic factors have predictive ability regarding achievement in higher education. These factors interact and influence the other factors, which are indicated by the dashed arrows in Figure 1.

Figure 1

Academic Success Diagram
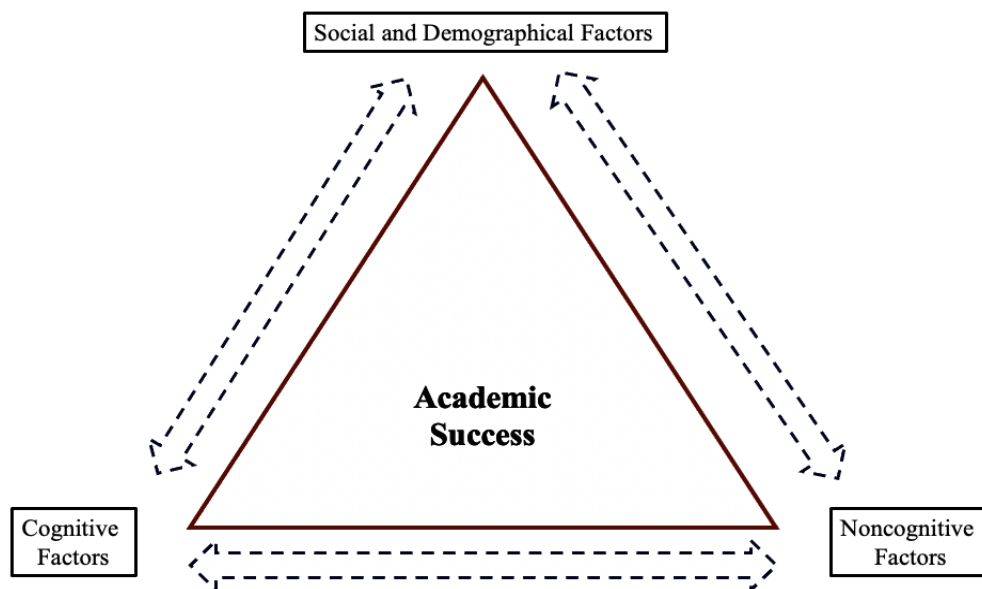
This chapter examines the literature concerning factors influencing academic success in higher education and NA education. This chapter also addresses an overview of the neural pathway as a component of the cognitive process, followed by a discussion of the other cognitive, noncognitive, and social-demographic factors that are influential and impactful to academic success. A body of research in NA education is also presented in this chapter. The presentation of findings was limited to NA education and other studies involving graduate nursing, non-nursing programs, allied health, and medical schools.

Cognitive Factors

The word cognition comes from a Latin root word cognoscere, which means "to know" (Sarason et al., 1994). Therefore, cognition refers to all the knowledge gained through various stimuli and sources (Sarason et al., 1994). Individuals with high cognition acquire the ability to gain knowledge from higher thinking, reasoning, decision-making, intelligence, and memory ability. Cognitive processes of individuals facilitate learning by the application and activation of short-term, long-term, and working memory.

Memory Systems

To retain information from all external sources, whether a lecture in a classroom, a demonstration in the simulation laboratory, or skills or concepts shown in a clinical setting, an individual must identify vital information to stimulate the neural pathways for

the storage of this information thereby stimulating the memory systems. The memory systems consist of the short-term, long-term, and working memory. In Figure 2, Atkinson and Shiffrin (1968) outlined the steps of the Atkinson-Shiffrin memory model in engaging the memory systems. The model highlights the information obtained from external sources such as the environment and information details gathered from senses. The individual receiving information engages focus and attention, which allows the brain to consciously perceive the details of a given set of information. Attention is very crucial, as this is considered the initial step in the memory process. Without attention or focus, the brain is unable to store information in the memory systems. Once this information is perceived in the brain, it is sequestered in two areas: short-term memory and working memory. Since information sequestered in the short-term and working memory is limited and vulnerable to decay as duration or time elapses, all information is stored in the long-term memory for future retrieval and recall.

Figure 2

Atkinson-Shiffrin Memory Model
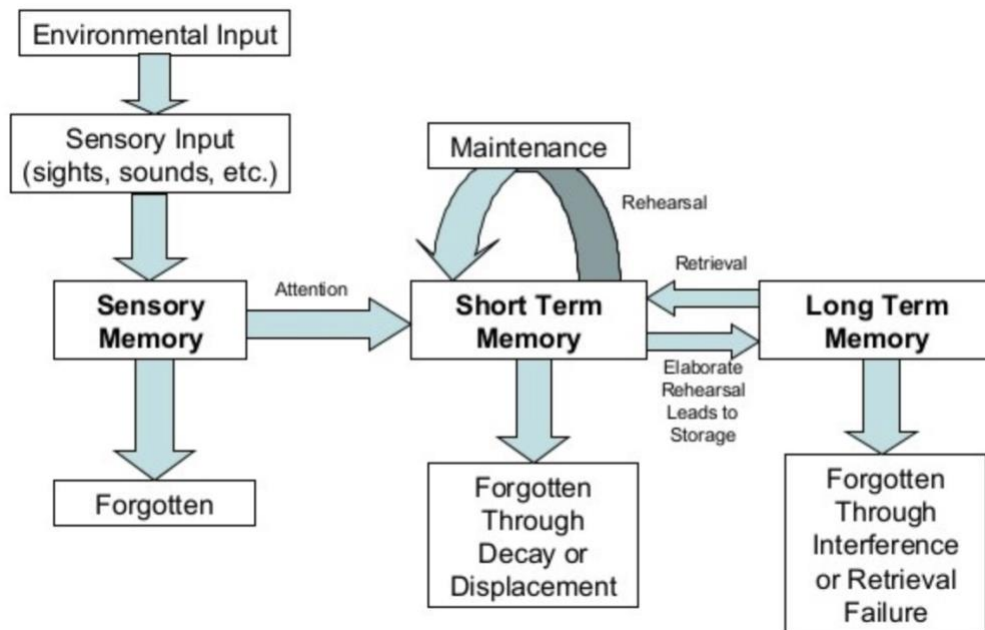
Adapted from: Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: a proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), *The Psychology of Learning and Motivation: Advances in Research and Theory* (pp. 89–195). Academic Press.

  To learn new concepts, students must be able to receive and process information. As stated above, information is first stored and processed in short-term memory. Short-term memory, or primary memory (a term coined by James [1890]), is an active system storing temporary information in a way that allows it to be retrieved quickly and for immediate use. However, short-term memory has limited memory storage capacity and

duration (Atkinson & Shiffrin, 1968). The limited capacity means that, as new information is learned, older information is replaced. The work of Jaquith (1996) on the correlation between short-term memory and academic performance showed that short-term memory was a reliable predictor of reading and math achievement in students. In this study, Jaquith (1996) examined 546 students using a digit span test, a standard test for cognitive and neuroscience experiments, to measure visual and auditory short-term memory. The test involves a series of sequential numbers shown on a screen one at a time. The participants click the numbers in the same order. The number of digits increases with correct answers, and performance is indicated by the average number of digits correctly remembered.

For learning to occur, an individual accesses short-term memory information and combines this with prior knowledge. The ability to integrate new information with prior knowledge is relatable to NA training. In NA education, a student understands and comprehends a neuromuscular blocking agent's mechanism based on the student's experience and prior knowledge of the same agent while working in the critical care setting prior to matriculation in NA school (Henrichs & Thompson, 2009). Since the information storage capacity of short-term memory is limited, the individual must activate the memory repeatedly to retain the information and sustain learning.

Like short-term memory, working memory has limited temporal capacity storage (Baddeley, 2000). The mechanism of working memory is explained in Figure 3. The

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working memory consists of a central executive system with two subslave systems: the phonological loop and the visual-spatial sketch pad (Baddeley & Hitch, 1974). Baddeley's working memory model suggests that information is sequestered in the central executive system, then sent to two slave processing systems (Baddeley, 2000; Baddeley & Hitch, 1974). The phonological loop is a sound processing system that analyzes and interprets incoming sounds heard through the ears. Conversely, the sensory information obtained from the eyes is processed in the visual-spatial sketch pad. The central processing center focuses on the perceived information and directs it to one of the two slave processing systems.

Figure 3

Baddeley Working Memory
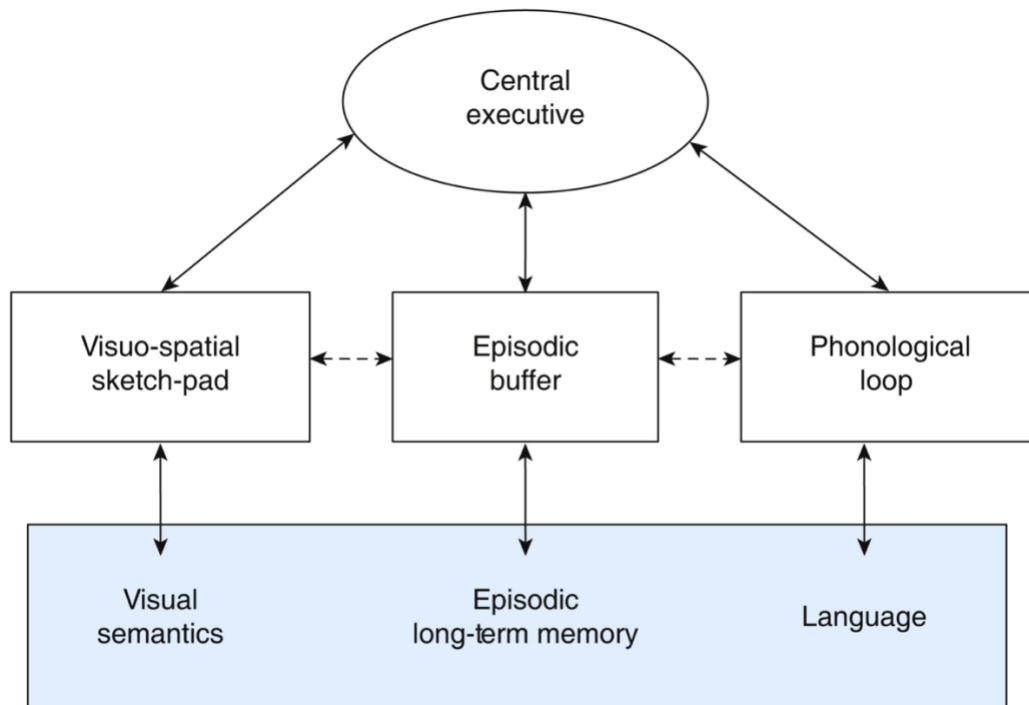
Adapted from: Baddeley, A. D., & Hitch, G. J. (1974). Working Memory. In G. A. Bower (Ed.), *The Psychology of Learning and Motivation* (pp. 47–89). Academic Press.

The information stored in the working memory is subject to decay (Cowan, 2010). The working memory can only hold information for 20–30 mins, and if the information is not retrieved, the information is obliterated (Baddeley & Hitch, 1974). Working memory also can store limited information. Miller (1956) determined that an individual can remember no more than seven meaningful items or chunks. Findings from other research suggest that a young adult can remember three to four longer verbal messages or short

sentences (Gilchrist et al., 2008). The significance of the limited capacity of the working memory is related to recall, which is vital during high-stake exams when the student is experiencing test anxiety (Lukasik et al., 2019). Many studies use working memory as a theoretical framework in study skills and memory recall. Of all the memory processing systems investigated, working memory has been linked to academic success in children, high school-aged individuals, and individuals in higher education (Lukasik et al., 2019; Morales, 2015).

Long-term memory is the permanent storage of information and knowledge. Any student in higher education experiences multiple sources of information in a day. These pieces of information are stored in the long-term memory for retrieval in the future. The capacity of long-term memory is unlimited. However, Atkinson and Shiffrin (1968) suggest that long-term memory is not easily accessible and may require additional encoding of the information using semantic and visual modes. For example, to remember an individual's name, one has to use specific meaning and pictorial activity to recall the information. Hence, accessing information embedded in the long-term memory may take a few minutes, compared to short-term memory, which may access it immediately.

What separates an expert from a novice is the retention of information in long-term memory. Long-term memory solidifies information through redundancy, pattern, and meaning. Several styles of long-term memory have been identified. Tulving (1972) described episodic, semantic, and procedural long-term memory. Episodic memory is

part of the long-term memory that is responsible for remembering events or episodes in life. Semantic memory is involved in recalling general knowledge, and procedural memory involves *the knowledge of how to do things*.

Academic Intelligence

Quantitative measures of cognitive intelligence have been used to predict success in higher education. Most common among these are the students' GPAs. The cumulative undergraduate GPA and science GPA are variations on how GPA is used to measure academic success. The selection committee uses the student's GPA as a preadmission criterion in many higher education programs. The cumulative undergraduate GPA has been shown to predict success in the first semester of the nursing program and improve the chances of completing a nursing program (Hinderer et al., 2014; Kowitlawakul et al., 2013; Manieri et al., 2015; Timer & Clauson, 2011).

Similarly, science GPA was predictive of success in the first year of nursing (Hinderer et al., 2014; Kowitlawakul et al., 2013; Mthimunye et al., 2018; Murray et al., 2008; Wambuguh et al., 2016). The predictive power of undergraduate GPA has also been examined in other fields such as medicine, pharmacy, and business. Kuncel et al. (2005) reported the undergraduate pre-pharmacy grades correlated to overall GPA in pharmacy school and successful passage of the pharmacy board examination. Similarly, the undergraduate pre-medical school GPA was predictive of academic performance during the first two years in medical school (Jones & Thomae-Forgues, 1984).

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Graduate programs such as nurse practitioner (NP) programs also use undergraduate GPA as an admission criterion. The cumulative undergraduate nursing GPA yielded a positive correlation to the completion of the NP program. Patzer et al. (2017) reviewed the NP admission criteria and found that the pre-NP nursing course grades and science GPA correlate with success.

In NA school admissions, cumulative GPA and science GPA have been used to project the students' success. Burns (2011) reported that cumulative GPA and science GPA predicted NA students' progression from the didactic phase to the clinical training. Other studies examining the impact on NA education showed that the combination of cumulative GPA and the science GPA is linked to the completion of the NA program (Haritos et al., 1995; Mathis, 1993; Ortega et al., 2013). The science GPA alone has also been considered in studies on progression in NA education and the likelihood of obtaining a high GPA in the current anesthesia curriculum (Burns, 2011, Haritos et al., 1995; Reese, 2002). Although these authors suggest emphasizing the science GPA during admission, there is variability in the types of undergraduate science courses, making it difficult to generalize the findings of these studies.

Although many studies link GPA as a positive predictor of academic success in higher education, there is a concern regarding the grading system's inconsistency. A recent paper suggests increased issues regarding GPA inflation in higher education (Rojstaczer, 2016). These concerns highlight the debate of using standardized

examination scores as an alternative to GPA in admission decisions. At present, the preadmission aptitude's predictive validity, such as the total GRE scores, for academic success in graduate school is controversial, and the relationship between GRE scores and NA student's academic success is debatable. Authors argued that the GRE only measures a particular aspect of intelligence and may be subject to cultural bias (Mupinga & Mupinga, 2005; Reynolds & Suzuki, 2013). Resistors to using the GRE as part of the admission requirements in graduate school admissions argued that the GRE acts as a barrier, impeding equity and inclusion efforts (Katz et al., 2009). In 2014, the Educational Testing Services reported that the overall average GRE of underrepresented individuals and women is lower than White and Asian-American men, highlighting the bias and disparity of the GRE (Wendler & Bridgeman, 2014).

Strategic and Deep Learning

One of the significant cognitive factors of academic success is how students learn new information. Learning can be divided into three major components: input, the processing phase, and output (see Figure 4). According to Tobias (1979), the input component represents the materials' presented to the students in a classroom setting or otherwise. The processing phase denotes the time when students encode, organize, and store inputs. Lastly, the learning model's output component represents the students' performance, the actual examination. This learning model allows for deeper learning to occur.

Figure 4

The Three Components of Learning

| Input | | Output |

Instructional methods, displays of content, etc. — Processing of input to store, retrieve, or transform it — Criteria — Anxiety. Method A — High reliance on Process A. Method B — Low reliance on Process A.
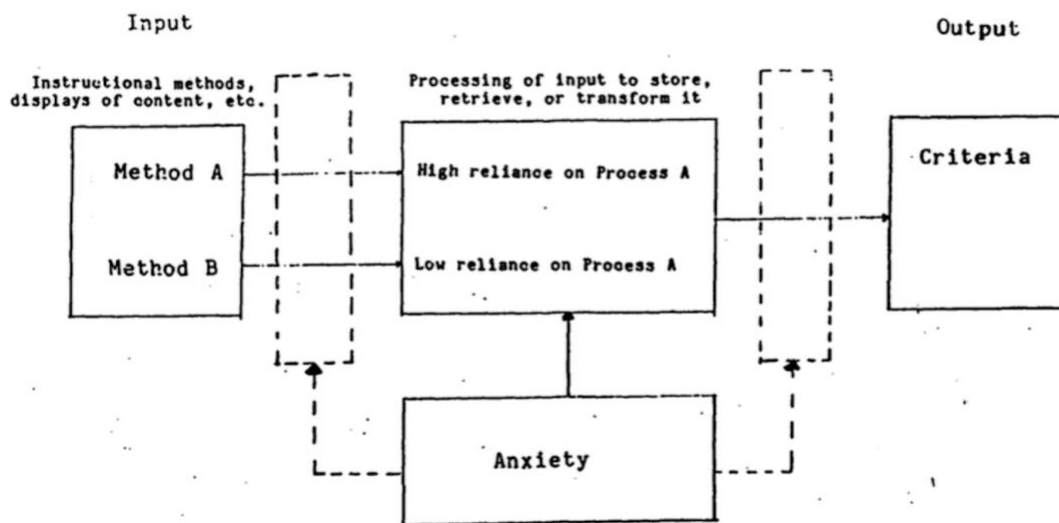
Adapted from: Tobias, S. (1979). Anxiety research in educational psychology. *Journal of Educational Psychology*, *71*(5), 573–582.

Empirical evidence has demonstrated a correlation between a concept called *deep learning* and academic performance. Findings of these studies show that those students who exhibit deep learning have higher grades and high term retention (Biggs, 1989; Duncan & Mckeachie, 2005; Hall et al., 2004; Tynjälä et al., 2005; Vermunt & Vermetten, 2004). As opposed to surface learning, deep learning involves an individual's motivation to learn and develop strategies to understand and relate new knowledge to previous knowledge. The development of deep learning techniques has improved student engagement in academic and clinical training, although strategies to improve student

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engagement may vary depending on the student's degree plan. In nursing, deep learning approaches have increased student engagement in both the academic and clinical portions of the program (Carrick, 2010).

To further understand how students learn and the best means for enhancing student learning and increasing academic success, researchers combined the students' preferences in learning and studying into the Approaches and Study Skills Inventory for Students (ASSIST) inventory. This tool was an updated version of the Approaches to Studying Inventory (Entwistle et al., 2013). The ASSIST is a standard tool used to measure the three different learning strategies namely: surface, deep, and strategic learning. First, students using the surface learning approach employ unrelated memorization and ineffective study techniques. Second, deep learning approaches combine thinking and evidence of learning techniques. Last, strategic learning incorporates both surface and deep learning methods. Studies using ASSIST to measure learning and studying show that the strategic approach is more predictive of academic success than either surface or deep learning on their own.

Noncognitive Factors

Academic performance is not only driven by the students' intellectual abilities. The bulk of literature predicting academic success in higher education involves a wide array of noncognitive or non-academic factors. Noncognitive or non-academic factors are "behaviors, skills, attitudes, and strategies crucial to students' academic performance and

persistence" (Nagaoka et al., 2013, p. 46). These may include study skills, study habits, study attitudes, motivation, self-efficacy, and locus of control (Conner, 2015; Crede & Kuncell, 2008; Doménech-Betoret et al., 2017; Galyon et al., 2011; Yokoyama, 2019).

Study Skills and Study Habits

When an individual uses study skills, they are engaging sets of appropriate study strategies and techniques to increase learning and manage time and available resources appropriately (Crede & Kuncell, 2008). It is reported that study skills are predictive of the academic achievement of students. Psychological and educational researchers examine study skills, which involve learning association, focus, and concentration, information processing, selecting main ideas, test strategies, and memorization, as the primary variables in learning. Study skills are operationalized using psychometric tools, like the Study Skills Assessment Questionnaire of Counseling Center of Houston University. The components of study skills were expanded to include time management, note-taking, memorization, reading, and writing (Study Skills Assessment Questionnaire, 2020). Khali et al. (2017) investigated the association between effective test strategies and study skills in 180 medical students from three different cohorts. The study reported that effective test strategies and study skills improve the students' performance in the anatomical sciences and United States Medical Licensing Examination (USMLE) Step 1 examinations. In this study, Khali et al. (2017) described effective time management involving the conscious

utilization of a structured, timed review of the materials, which were beneficial for medical students in science-based classes.

Another tool measuring study skills is the Learning and Study Strategies Inventory (LASSI). LASSI is a widely used instrument that assesses student learning and study strategies (Weinstein & Palmer, 2002). One of the subscales of this instrument is time management. Kenner and Weinerman (2014) described two activities that are effective in managing time wisely. First, time management can be a strategic approach to studying complex concepts than easy ideas. Allowing extra time to review complex concepts increases retention and self-confidence. Second, another approach to effective time management is balancing time between school and family. A final psychometric tool for assessing study skills can be found in the Study Behavior Inventory (SBI). This examination measured an individual's abilities in preparation for class and rework, doing homework, and the assigned reading as assessed in the SBI tool (Bliss & Mueller, 1993).

Test-taking strategies are another component of study skills. Effective test strategies have a significant positive correlation with academic performance. Zhou et al. (2016) recommended that medical students with low test-taking strategies receive focused academic assistance to avoid noncompletion and dismissal from academic programs. They also suggested frequently monitoring students' achievements to identify weaknesses by completing test strategy surveys. Altogether, students with practical study skills are linked to a higher GPA.

Study habits can be defined as the students' ability to engage with regular acts of studying using appropriate study routines in an environment conducive to learning (Crede & Kuncell, 2008). Study habits are a combination of study skills and behaviors that facilitate learning through problem-solving and critical thinking. Jafari et al. (2019) identified certain behaviors beneficial for students, such as studying in a quiet place, turning off devices and social media feeds, regular rests, and breaks between studying and prioritizing study contents and materials. Alzahrania et al. (2018) evaluated 257 medical students' study habits in Tehran to maximize learning outcomes. The authors operationalized study habits as study time, study partners, source of study, breaks, study interruptions, difficulty concentrating, study activity, and delayed study. Their findings suggested that high-performing students have healthy study habits compared to low-performing students.

Test Anxiety

Test anxiety (TA) is another factor that affects academic performance of students. TA is a pervasive concern for students and teachers in undergraduate and graduate-level programs. Many studies identified TA's incidence rate as ranging from 20–30% among college undergraduate students (Cai et al., 2018; Huntley et al., 2016; Lowe et al., 2011; Reiss et al., 2017). For graduate students, the number of students experiencing TA is higher. It is estimated that the number of graduate-level students experiencing anxiety level is as high as 60% (Khan et al., 2006; Saravanan et al., 2014). Although these data

were obtained from a small effect size, the statistics call for attention and action in developing strategies to mitigate TA in all levels of education.

The phenomenon of TA is complex, and a single definition may not fit all constructs that encompass TA (Lowe et al., 2011; Reiss et al., 2017; Sharma & Sud, 1990; Spielberger & Vagg, 1995; Zeidner, 1998). Although complex, two distinct dimensions of TA have emerged from previous studies: *emotionality* and *worry*. Emotionality is the somatic, autonomic, and physiological manifestations of TA characterized by increased heart rate, increased temperature, stimulation of the sweat glands, and signs of panic (Spielberger & Vagg, 1995). These signs and symptoms interfere with performance and recall. Conversely, the cognitive behavior defining TA refers to negative thoughts, which influence test performance. Zeidner (1998) described this cognitive behavior as the state of worry that the consequence of failure may lead to a lifetime failure and adverse outcomes. Sharma and Sud (1990) concluded that TA includes cognitive behaviors such as worry and fear of poor performance in examinations and other evaluative processes. In many studies, worry is closely related to performance and achievement success (Sharma & Sud, 1990; Spielberger & Vagg, 1995; Zeidner, 1998).

Another TA construct is the person's task-irrelevant behaviors, often described as poor study skills and study preparation, avoidance, and procrastination. Tobias (1979) suggested that poor study skills, a combination of poor study skills and preparation, affect

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cognitive capacity, remembering, and recall. Furthermore, Tobias proposed that poor study skills complement anxiety, which can, in turn, decrease performance by lowering cognitive capacity (Tobias, 1979).

As in other disciplines, TA affects nursing students' academic performance and success (Howell & Swanson, 1989; Shapiro, 2014). In a systematic review of 12 studies, TA occured in 30% of nursing students at the undergraduate level (Shapiro, 2014). Although limited published data shows TA's prevalence at the graduate level in nursing, it is expected to be higher because of the higher stakes related to graduate-level courses and student types. Shapiro (2014) reported two significant TA dimensions in a systematic review, as measured by the Test Anxiety Inventory. Graduate-level worry was noted to be the typical TA construct in all of the review studies.

Students' anxiety levels increased exponentially in nursing simulation training because of multiple factors (Nielsen & Harder, 2013). One factor is students' perceptions of faculty as unsupportive or intimidating. Similarly, students' confidence is seemingly low because they are unprepared and that they are "targets" of unwarranted discussions making the students vulnerable to shame and embarrassment, mostly if their performances in simulation scenarios were unsatisfactory (Nielsen & Harder, 2013).

Motivation

A student's attitudes towards studying and the student's educational goals are also correlated with academic performance (Crede & Kuncell, 2008; Ford, 1992). In the

motivational system theory, Ford identified three psychological functions underlining an individual's motivation: personal goals, emotional processes, and personal agency belief (Ford, 1992). Ford (1992) asserted that an individual who knows what they want and knows their capabilities will likely succeed within a conducive environment. In NA, students who are motivated to learn are likely to persist at new and complex tasks. Hence, persistence is another component of study motivation achieved through simulation and on-site clinical experiences. In disciplines in which patient care is essential, allowing students to perform a task until they reach a certain comfort level encourages them to continue learning the skill.

Villa et al. (2017) studied students' attitudes and academic performance in chemistry and physics courses. The findings showed that positive attitudes toward school and learning are directly proportional to their academic grades in both courses. Villa et al. (2017) encouraged educators to consider those study attitudes. Further support can be found via LASSI, which, through study, has shown that academic success is linked to the learner's motivation and attitude toward learning (Weinstein & Palmer, 2002).

Some researchers consider student retention as an indicator of student success. Brookman (1989) examined an advising program that improved student retention using Maslow's hierarchy of needs, a motivational theory based on the premise that humans have prioritized needs (Maslow, 1970). In order for individuals to feel safe, one has to meet or satisfy their physiological needs. Once the physiologic needs are met, the person

will seek another goal to feel safe. Maslow's theory may be grouped under the nativist

educational perspective because the framework focuses on the inner self, the individuals'

desire and motivation to learn (DeMarco & Tilson, 1998).

Self-Efficacy

Self-efficacy is "an individual's belief in his or her own ability to organize and

implement action to produce the desired achievements and results" (Bandura, 1997, p. 3).

As a critical element in Bandura's social cognitive theory, self-efficacy is an individual's

ability to succeed in a situation, task, or challenge by controlling his motivation,

behavior, and social environment. Previous studies summarized the positive correlation

of self-efficacy and student achievement across academic disciplines and levels (Conner,

2015; Fonteyne et al., 2017; Imus et al., 2017). Self-efficacy is, therefore, closely related

to academic motivation. In the social cognitive expectancy-value model, three variables

are interconnected and affect academic achievement: social world, cognitive processes,

and motivational beliefs (Doménech-Betoret et al., 2017). Highly self-efficacious

individuals develop strategic plans and actions to meet a set goal.

A feature of self-efficacy is the student's satisfaction with the teaching-learning

process, which is influential in the student's academic achievement. A student is not

motivated and self-efficacious if he is not satisfied with the learning process, the subject

matter, and the facilitator of learning. Educators see the importance of student satisfaction

as a barometer of effective teaching. Educators are interested in whether the students

learn and if the students are satisfied with the learning. Similarly, self-efficacy is significantly crucial in academic performance as a measure in the Motivated Strategies for Learning Questionnaire instrument (Pintrich et al., 1991).

Locus of Control

The perception that one's outcomes result from one's behavior or external forces is called locus of control. Rotter (1966) developed the personality dimension locus of control and conceptualized the two different classifications: internal and external locus of control. Rotter (1966) suggested that individuals believed their lives are controlled either by themselves or external factors. Hard work, decision-making, problem-solving skills, effort, and persuasion are characteristics of an individual with a high internal locus of control. Individuals with a high external locus of control believe that their behavior was influenced by luck, fate, chance, and the people around them.

Previous studies show that students with a high internal locus of control are more likely to achieve high academic performance scores (Crede & Kuncell, 2008; Hulse et al., 2007; Patzer et al., 2017). Those with a high internal locus of control can adjust and manage failure or challenge. In most studies, a high external locus of control may not correlate with success, although in NA studies, it was found that those with a high external locus of control are twice as likely to be successful (Hulse et al., 2007; Wilson et al., 2015)

Social and Demographic Factors

Research on academic success is extensive, and some studies highlighted the importance of the students' social and demographic characteristics. Socioeconomic status, gender, age, interview scores, and emotional intelligence were highly studied correlates in educational and psychological research.

Socioeconomic Status

There is a moderate relationship between the socioeconomic status of the student and academic achievement in higher education. Rodríguez-Hernándeza et al. (2020) reported that students from low-income families, low-level education, and low-level jobs seem to underperform academically. Also, there is an educational disparity when it comes to student performance in higher education. The inability of students to attend school due to increased fees may have caused some of the increased dropouts in high school education.

Gender

Gender is another factor that is linked to academic performance and achievement. There is a wealth of evidence suggesting that female students outperform male students in many areas of higher education. Pirmohamed et al. (2017) argued that the main difference between male and female students is academic performance due to academic motivation. A meta-analysis spanning 100-years of studies, females exceed males in

terms of course grades, high school graduation rates, matriculation in tertiary education, and completion rates (Voyer & Voyer, 2014).

Number of Years as a Nurse

Nursing experiences have also been reported as a predictor of academic success in graduate nursing programs. Burns (2011) reported that one of the causes of high attrition rates in NA is the number of years the student has worked as a nurse. This also relates to the number of years the student has been out of school. In this study, the student's age at the time of matriculation is inversely proportional to the current GPA. In all, there is limited evidence on the strength of the relationship between the number of critical care nursing experiences and graduate nursing program progression (Patzer et al., 2017).

Emotional Intelligence

Emotional intelligence (EI) has been linked to academic success, successful leadership, and professional success (Benson et al., 2010; Holahan & Moos, 1991; Walker, 2006). An individual with high EI is a person who is emotionally aware of himself and his surroundings and uses this awareness to enhance emotional decisions and intellectual endeavors. EI is, therefore, the ability to use emotion in decision-making in daily activities depending on the situation. The rigors of didactic learning and clinical training increase the stress levels of the NA students. With stress harming academic achievement, having a high EI equips the NA student to deal with the challenges during classroom activities and clinical training.

In NA education, Collins (2013) evaluated the impact of EI on NA program completion and successful passing in the NCE. In the study, Collins surveyed 216 students from four different programs in the southern-eastern United States. The Mayer-Salovey-Caruso Emotional Intelligence Test, a 141-item ability-based measure, was administered at the start of matriculation, after 1 year of study, and in the last semester of the program (Collins, 2013). The author noted students' ability to perceive emotions, which can be beneficial in dealing with professionalism in both didactic learning and clinical training. Another significant finding of the study was the predictive ability of EI and the NCE (Collins, 2013).

Academic Success in NA Education

A review of the literature spanning 30 years provided empirical evidence beneficial to NA student's academic success. The available literature examined the primarily descriptive study of preadmission criteria linked to completing the program and passing the certifying examination. The investigation of academic success in NA education began when the attrition rate was first published. As NA education transitioned from hospital-based to a university setting, in pursuit of a master's level degree, the attrition rate increased, reaching as high as 25% between 1985 and 1990 (Mathis, 1993). Two early studies examined the predictive capacity of cognitive factors emphasized in preadmission criteria, such as the cumulative GPA, science GPA, and the GRE scores, in NA students' progression, retention, and passage of the NCE. In 1993, Mathis surveyed

all NA program directors and reported that 21% of the cause of the dropout rate of students who did not complete their programs resulted from academic performance (Mathis, 1993). Another study reviewed the admission criteria and the predictive abilities of these requirements to complete the program. Haritos et al. (1995) examined the role of cumulative GPA and completion of the NA program. Their study noted that the cumulative GPA, science GPA is a strong predictor of academic performance in NA school.

The transition of NA education to a master's degree level in 1998 saw an increase in schools and graduates. It was determined that the transition might have changed the attrition rate. Dosch et al. (2008) further examined the attrition rate by surveying NA program directors to evaluate this assumption. In this study, Dosch et al. (2008) found that 30% of the attrition rate was caused by dismissal for academic reasons. Wilson et al. (2015), whose academic institution has reported a 5 year attrition rate of 20%, addressed the high attrition rate by conducting a retrospective study of student's cognitive and noncognitive variables. The study identified personal, family, and motivational factors as primary reasons for the higher attrition rate. These outcomes were similar to previous studies highlighting noncognitive factors as determinants of NA education's attrition rate (Burns, 2011; Hulse et al., 2007; Markert, 1984; Mathis, 1993; Ortega et al., 2013; Stetto et al., 2004).

Social and demographic factors have been reported as a predictor of academic success in NA education. Although age and gender are not part of the admission criteria and are illegal and unethical to consider as requirements for admission, some literature has reported its predictive ability. Women and younger students have an increased likelihood of completing a NA program than men and older students (Wilson et al., 2015). Similarly, critical care experience is inversely related to academic progression (Burns, 2011). However, this finding is based on a survey obtained from NA program directors. No empirical evidence has shown the relationship between the number of years of critical care experiences and graduates' completion (Donnelly, 2005; Hough, 2008; York & Smith, 2007).

The socioeconomic burden of NA education is mainly due to cost. Aside from expensive tuition and fees, NA students lose their income when they are encouraged to end their full-time employment. The financial burden is a source of stress during matriculation. Stress in NA education is either a positive motivator or a negative impact on academic performance in NA education (Conner, 2015). In a survey of 1,374 NA students, a stress level of 7.2 on a scale of 1–10, with 1 being the least stress and 10 being the most, was recorded as a daily average of the stress of NA students (Wildgust, 1986). Information overload and fear of academic failure are a few of the causes of stress in NA education (Wildgust, 1986). Excessive stress results in detrimental consequences that may hinder student's progression and impair patient safety in the worst-case scenario.

Some clinical symptoms linked to stress in NA students are depression and suicidal ideation (Chipas et al., 2012). Understanding the dynamics between NA school and stress helps nurse educators create support systems, such as stress management and social support, to increase academic performance and retention (Conner, 2015).

Self-efficacy, locus of control, and EI are other associated factors to academic achievement in NA education (Collins, 2013; Conner, 2015; Hulse et al., 2007; Imus et al., 2017; Wilson et al., 2015). Studies in these areas show a positive impact on student success with few limitations:

1. The EI assessment is new to NA education, and limited substantial evidence exists inferring the positive correlation of EI to academic success.

2. These factors were assessed using psychometric tools with no emphasis on the students' actual experiences, providing a rich understanding of these factors.

3. With few studies in NA education, more studies are needed to elucidate these constructs' nature to academic success.

The current amount of literature in NA education is not enough to fully understand factors impacting academic success. Conducting a qualitative study on academic success will add new ideas of NA students' experiences and enrich our understanding of academic performance in NA education. The knowledge created from this study will act as a catalyst for change in various areas of NA education, including but

not limited to admission criteria, development of remediation structures, and creation of support systems to improve academic success in NA education.

Chapter Summary

Academic success is a multidimensional phenomenon requiring prompt attention from educators. The robust data from studies in higher education reveal the positive relationships of several variables and factors to academic achievement. In NA education, the available data is scarce in identifying predictors of academic success because of three possible explanations:

1. There is variability in conceptual definitions and operationalization of academic success, making it challenging to generalize outcomes across the country's NA programs.

2. The published data have not included students who are currently in a doctoral-level education. The revised curriculum could impact these factors as the COA mandates the transition to a clinical doctorate as entry-level to practice.

3. With more data on the quantitative variables correlating with academic performance, a deeper understanding of factors influencing academic success from the students' perspectives during matriculation in the didactic learning phase is lacking.

Although there are data to justify the positive linkage between cognitive, noncognitive, and social factors to academic success, the need to understand factors from the students' perspectives may lead to a change in academic policies and practices.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

Admission to NA programs is a competitive process. Not all prospective students meeting the rigorous admission criteria are offered a spot in their chosen program. Program selection criteria differ with the most common variables in program admission including the overall GPA, science GPA, GRE scores, critical care experience, interview scores, and assessment data on emotional intelligence and grit (Burns, 2011). All nurses admitted into a NA program met stringent requirements and were deemed students who would most likely succeed in a rigorous and intensive 36–40 month academic and clinical training. However, evidence suggests some matriculated students are not academically successful and thereby, unable to complete the program. The most widely reported reason for the high unsuccessful rate is the failure to maintain an overall GPA of 3.0 in anesthesia and non-anesthesia courses during the didactic phase. Academic success and failure of these highly academically prepared students require attention from educators. The review of the literature yielded a wide variety of cognitive and noncognitive determinants that predict academic success. Research studies in NA programs highlighted academic success through examination of admission criteria as predictors of academic performance. Other studies also focus on noncognitive factors correlating to academic success. However, the need to explore factors affecting students during the didactic

learning phase requires research to add new dimensions and unique perspectives to the body of research influencing academic success.

This study used a qualitative descriptive research design to explore factors influencing NA students' academic success during the NA curriculum's didactic learning phase. Findings of this study may have implications for NA education, policy, and practice. In this chapter, the research methodology, including the setting, participants, data collection, and analysis, are described in detail. Efforts to maintain study rigor and protect human subjects are also addressed.

Qualitative Descriptive Design

The body of research in NA education has a wealth of studies examining the correlation between cognitive and noncognitive factors to academic success. However, studies investigating strategies for academic performance are scarce. A better understating of factors influencing success during academic training is needed to add a new dimension and a unique perspective of factors that contribute to academic success in the didactic portion of NA education. Given the gap in the literature of factors identified by NA students regarding academic success during the didactic phase of the NA education, a qualitative descriptive methodology was selected for the study. Qualitative research, in general, attempts to make sense of an event or a phenomenon by adding meaning to it in the social environment in which it occurs (Creswell, 2013; Grove et al., 2013; Polit & Beck, 2016). Compared to quantitative research, a qualitative approach to

understanding a phenomenon is through the postpositivism worldview (Creswell, 2013; Polit & Beck, 2016). A postpositivist paradigm is concerned with the subjective stance of reality and is based on the participant's experiences and perspectives (Guba, 1990).

Qualitative descriptive methodology is theoretically grounded in naturalism, a central context, and a realistic view of the participant's experiences of the event or phenomenon under investigation (Kim et al., 2017; Lambert & Lambert, 2012). A qualitative descriptive study chronicles a comprehensive summary of an event experienced by the individuals and explores a poorly understood phenomenon (Creswell, 2013; Sandelowski, 2000). The qualitative description offers a "comprehensive summary of an event in the everyday terms of those events" (Sandelowski, 2000, p. 336). Naturalistic inquiry creates and develops an understanding of the event's objective truth or phenomenon by acquiring the participant's experiences (Bradshaw et al., 2017; Colorafi & Evans, 2016; Willis et al., 2016). Instead of looking at a phenomenon as an observer, the researcher immerses himself in the context of the phenomenon using naturalistic inquiry. Since a qualitative descriptive study seeks to understand the rich and detailed description of the phenomenon described by the participants, researchers use the participants' words and perspectives as starting points in the analysis. In understanding the participant's experience of the phenomenon, the study investigator's background may influence the participant's description of the events. Parahoo (2014) suggested the difficulty for a naturalistic researcher not to infuse his philosophical views of the

phenomenon under investigation. Reflexivity was exercised to emphasize the importance of self-reflection of the researcher's social background, assumptions, and behaviors that affect the research process.

One of the qualitative descriptive study assumptions is relativism, implying the subjectivity of the participants' experiences. Because realities differ, and the interpretation of these multiple realities is subjective, language is vital in presenting these realities (Frowe, 2001). A detailed description of the experiences uses easily understood language (Sullivan-Bolyai et al., 2005). Thus, researchers begin the in-depth analysis by describing the literal definition of the event or phenomenon at the "surface of the data and events" (Sandelowski, 2000, p. 336), followed by the analysis of the meanings (Sandelowski, 2002).

Knowledge obtained from the qualitative descriptive study is based on subjectivism. This means that the knowledge developed and communicated is entirely based on the participant's subjective awareness of realities. Researchers interpreting realities described by study participants should use verbatim quotations (Lambert & Lambert, 2012; Willis et al., 2016). The addition of knowledge created from the study can lead to development, revision, and changes in policy. In the healthcare system, qualitative descriptive studies can provide clear information and improve healthcare practice.

Setting

The setting of this study was all higher education institutions and healthcare organizations where NA students are enrolled and affiliated during the clinical training. In the US, all schools adhere to the COA's curricular standards, composed of sequential and integrated courses designed to graduate NA students focusing on the full scope of NA practice. The sequence of the curriculum may vary depending on institutional guidelines and types of NA program; however, the following didactic courses are essential: advanced physiology/pathophysiology, advanced pharmacology, basic and advanced principles in NA, advanced health assessment, research, genetics, acute and chronic pain management, radiology, ultrasound, anesthesia equipment, professional role development, wellness, and substance use disorder, informatics, ethical and multicultural healthcare, leadership and management, the business of anesthesia/practice management, health policy, healthcare finance, and integration/clinical correlation.

Participants

The participants of this study consisted of the NA students who successfully completed the didactic courses. Didactic courses are those non-clinical classes offered in the entire program. There are two standard curricular sequencing of NA programs in the US: integrated and front-loaded. In an integrated curriculum, the curricular sequence is a combination of didactic and clinical content in which the non-clinical contents are given in Year 1 to Year 3. The front–loaded program is a curricular design in which most of the

didactic learning or the non-clinical component is administered in the first 12 or 16 months. The remaining didactic classes are scheduled during the remaining 16 or 20 months of the program.

Recruitment Strategy

Purposive and snowball sampling was used to recruit study participants. Recruitment started after the Internal Review Board (IRB) approval. Recruitment flyers were posted in a NA program director's forum, NA social media groups, and were emailed to all NA program directors using a publicly available database (see Appendix A). Interested students who volunteered to participate were screened for eligibility (see Appendix B). Once participants met the eligibility criteria, a confirmation letter was emailed explaining the description of the proposed study and time commitment (see Appendix C). Questions regarding the purpose of the study were answered in a timely manner. Once the participant agreed to volunteer in the study, the participant was asked to choose a convenient date and time for the interview. Students who participated were encouraged to distribute recruitment materials to other students as part of the snowballing technique.

There is no rule for the approximate sample size in qualitative research; however, the sample size must be relevant to answer the research question and provide rich information on the phenomena. Similar studies show that a sample size ranges from 10 to 16 participants were adequate (Ciezar-Andersen & King-Shier, 2020; Mason, 2010).

Hence, this study started with a sample of 12 students with a plan to cease data collection when data saturation was achieved.

Participants were eligible to participate in this study if they met all of the following requirements: students currently enrolled in an NA school for 18 months or more and those who completed and passed the didactic portion of the NA curriculum in their respective institution. Participants were excluded if students have not passed the didactic component of the NA program in their institution, who have been in the NA program for less than 18 months, and current students from the researcher's employment.

Protection of Human Subjects

An IRB approval was obtained from Texas Woman's University. There were four potential risks foreseen in this study: loss of confidentiality, loss of time, emotional discomfort, and coercion. Strategies to minimize these risks were undertaken during the study. The privacy of the participants was maintained during the study. Personal information was not identifiable. All the interviews were conducted using a video-assisted platform. During the interview, the researcher ensured that the participant was safe and secure. Before the interview commenced, the researcher asked the participant if he was comfortable sharing information over the communication medium.

The consent form (see Appendix D) and the demographic questionnaire (see Appendix E) were given via email communications to the participant ahead of the interview schedule to allow the participants to read the form and later ask questions. On

the day of the interview, the consent was thoroughly explained, and any questions answered. Maintenance of confidentiality was considered a high priority. Participants were told before the interview to use aliases for persons or entities who were subjects of their experiences during the interviews to protect confidentiality. The interview was audio-recorded using password protected-digital audio recording. To maintain confidentiality of all transcripts, all personal information was replaced by common nouns unrelated to the participant. After all the phone or online audio interview data were transcribed, all transcripts were stored in a secure location in the researcher's home office, protected by a password. All digital device recordings were deleted and erased permanently based on the specific device's instructions.

To mitigate the potential risk of loss of time, the researcher asked the participant to set the interview's date and time. The researcher expected issues with time zone differences; the participant's choice of time was taken into consideration. An initial communication to determine the full eligibility of the participant was conducted. In that time frame, the researcher informed the participant of the time commitment of the study. Nonetheless, the participant was informed of his right to stop participation at any time.

Emotional distress was mitigated by informing the participant that he does not need to answer all the interview questions and has the right to stop participation in the study. If the participant felt emotional stress in the middle of the interview, the interview

was canceled without any ramifications. The participant could withdraw from the study anytime without any penalty.

Data Collection

This study explored the NA student's experiences of factors influencing academic success in NA education. A semi-structured interview was the method used to collect data in this qualitative descriptive study (Stanley, 2015). Through this form of data collection, the researcher encouraged the participants to engage freely in the in-depth and rigorous description of academic success, promoting rich data collection for new ideas or concepts to develop (Doody & Noonan, 2013; Fetterman, 1998; Sandelowski, 2000). Therefore, virtual face-to-face, or telephone interviews were options to gather data for this study. The date and time of the interview were selected by the participants. Each interview lasted about 60 minutes or less. The questions developed for the semi-structured interview were generated to answer the research question.

Furthermore, the open-ended questions were peer-reviewed and supported relevant literature on NA education (see Appendix F). Examples of open-ended questions include: (1) How do you define academic success? Or, when you hear the words academic success, what comes to your mind? What is your view about passing the didactic portion of NA school? Fieldnotes with rich descriptive and reflective information were collected during the interview. Signed informed consent and socio-demographic questionnaire were collected on the day of the interview.

Data Management

After each interview, the researcher listened to the audio recordings for completeness, making sure that recordings were clear and audible. The texts of the audio recording were transcribed verbatim. After transcription, the researcher reviewed the completed transcript for accuracy. Two copies of the transcript were made. One copy was used to highlight and identify words, phrases, and paragraphs that developed into condensed meaning units. Color-coding of the codes, categories, and themes were created in a separate file once words, phrases, and paragraphs were identified. The other copy with corresponding codes of the participants was stored in a secured password protected storage. Before data analysis started, the researcher coded the participants to identify them when presenting results using an alias. For example, Participant 1 was represented by P1 in the analysis.

Data Analysis

The data were analyzed using qualitative content analysis described by Granaheim and Lundman (2004). The interview was audio-recorded, and following each interview the recording was transcribed verbatim by a transcriptionist. The transcribed interview text was systematically analyzed and compressed into a highly organized and meaningful summary of critical results. Data analysis began by listening, reading, and reviewing the interview transcript multiple times to make sense of the experience of the phenomenon. This process allowed the researcher to understand the context or ideas of

the participant's experiences. The researcher extracted and abstracted the words, phrases, sentences, or paragraphs from many interview texts into smaller meaning units. The meaning units were then condensed and clustered together into codes, and these codes were grouped into categories in which themes were then generated. Categories were captured into similar or dissonant patterns, and eventually, the formulation of themes was done after reflection and discussion of categories. Table 1 describes the sequence of content analysis starting from studying the meaning units until the development of the themes (Elo & Kyngas, 2008; Graneheim & Lundman, 2004; Hsieh & Shannon, 2005).

Table 1

Steps in Graneheim and Lundman's Qualitative Content Analysis

Meaning Units	Condensed Meaning Units	Code	Category	Theme
Consist of words, phrases, sentences, or paragraphs unified by their content. Extracted from interview transcript and constitute the basis of the analysis.	Condensation is a process of shortening the text while preserving the core meaning	Code is similar to a label, a name that describes the condensed meaning.	Grouping of these codes that are related to each other through content or context. The organization of codes into a category describing the similarities or differences of the text's content.	Expression of the underlying meaning. A theme answers questions such as why, how, in what way, or by what means? A theme is intended to communicate with the reader on both an intellectual and emotional level.

Furthermore, Figure 5 addresses content analysis from the lower and higher level of abstraction of the transcribed interview text. Additional field notes were taken to augment data quality. The field notes contained descriptive and reflective information

with essential data such as location, setting of the interview, and the interaction during the interview. Also, the researcher's feelings, reactions, and impressions of the experiences and the researcher's reflection of the interview experience were included in the field notes. The field notes were completed following each interview and provided additional data to the interview transcripts.

Figure 5

Qualitative Content Analysis Describing Lower and Higher Level of Abstraction
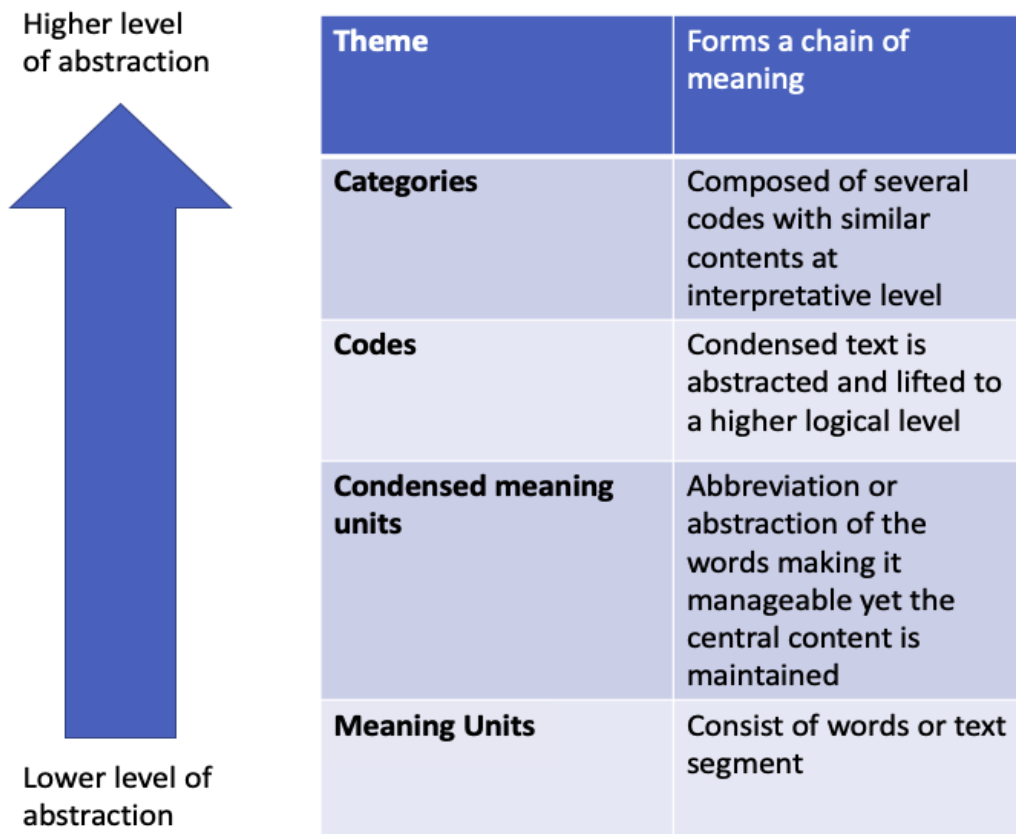
Qualitative content analysis is a continuous process rather than a linear progression. Creswell (2013) called this process a data analysis spiral because the researcher continuously readjusts the codes and categories from the raw data until connections and relationships are established. It was crucial to practice reflexivity and flexibility during analysis. The researcher maintained vigilance and awareness of personal preconceived understanding of the phenomenon to avoid bias during the analysis and interpretation of the findings.

Scientific Rigor

The quality of data and data analysis of this qualitative study was subjected to the principles of credibility, dependability, confirmability, and transferability to maintain scientific rigor and trustworthiness. Several strategies were employed to preserve credibility in this study (Bradshaw et al., 2017; Creswell, 2013; Polit & Beck, 2016; Shenton, 2004). Merriam (1998) compared the credibility of a qualitative study to the internal validity in quantitative research. Ensuring credibility in qualitative research was essential in establishing the trustworthiness of the data and the findings. The basic paradigm of qualitative description is the investigation of a phenomenon in its natural state. The researcher's background, assumptions, knowledge, and behaviors should not interfere with the interpretations of the participants' meanings. Therefore, it was necessary that the researcher engaged in reflexivity during data collection and analysis.

Frequent debriefing sessions with the chair assisted in enriching the interpretations of the findings through collaborative discussion. Interaction with the dissertation chair provided the researcher an additional and robust understanding of the research design. In addition, the experiences and perceptions of this expert are valuable in widening the researcher's vision. Outcomes of these frequent meetings drew attention to the study's flaws and inconsistencies and improve the overall research.

Establishing rapport before starting the interview created a trusting relationship between the researcher and the participants by creating mutual comfort, conversation ease, and connection. The researcher expressed compassion and empathy during the interview by allowing the participant to participate in ascertaining that the phenomenon's experiences are freely offered by those who genuinely wanted to participate in the data collection process.

The concept of dependability implies that the methodology employed in this study can be repeated in the same context; using similar demographics will result in the same findings. Since the nature of the phenomenon may change, Lincoln and Guba (1985) suggested that credibility and dependability are closely tied together. The same provisions used in maintaining credibility was employed in establishing credibility. In this study, dependability was supported through consistent use of the same interview questions to determine that all participants respond to questions on the study's same contents (Graneheim & Lundman, 2004). Although new insights were expected during

the first interview, the researcher ensured that follow-up questions did not deviate from the main interview questions' purpose.

Confirmability was maintained by ensuring that the findings of the study emerged from the participants' experiences and ideas rather than the researcher's preference. This was done by including direct quotes from the participants when presenting the findings of the study. Transferability was provided by describing factors considered by the participants to be critical in academic success with a detailed description of the characteristics of the participants, content analysis, and verbatim quotes (Graneheim & Lundman, 2004; Polit & Beck, 2016).

Chapter Summary

This chapter described the research design, methodology, data analysis, and scientific rigor of the study. Qualitative descriptive study was the appropriate design to explore factors influencing NA students' academic success during the didactic learning portion of their training. The data collection method was semi-structured interview and the data analysis applied Granaheim and Lundman's (2004) approach to content analysis. Provisions to ensure credibility, dependability, confirmability, and transferability were described in detail for transparency and clarity.

CHAPTER IV

ANALYSIS OF DATA

The central question that guided this study was: What factors influence academic

success in NA education during the didactic component of the NA program? The study

design was qualitative descriptive, which is theoretically grounded in naturalism, a

realistic view of the participants' experiences of event or phenomenon under investigation

(Kim et al., 2017; Lambert & Lambert, 2012). The student's experiences were explored

using the philosophical underpinning of postpositivism, in which the understanding of

reality is aligned with multiple versions of the truth. However, reality is individual and

dependent on the experiences of the participants. The data were collected following the

methodology outlined in Chapter 3. Data analysis was based on the proposed

mechanisms described by Graneheim and Lundman. This chapter presents the results of

data analysis, demographic data, and themes generated.

Research Methodology Applied to the Data Analysis

The literature is limited concerning factors associated with academic success in

NA education during the didactic learning phase of the NA program. With most of the

studies examining the predictive properties of preadmission data, understanding student's

experiences may shed some insights and provide a new dimension to factors affecting

academic performance in NA education. Therefore, a qualitative descriptive methodology

was selected for the study. Data were analyzed in accordance with the qualitative content analysis as described by Granaheim and Lundman (2004). The units were condensed and clustered together into codes. These codes were grouped into categories from which themes were generated (Elo & Kyngas, 2008; Graneheim & Lundman, 2004; Hsieh & Shannon, 2005). An example of a concept and analysis procedure of transcribed texts are shown in Table 2.

Table 2

Example of Graneheim and Lundman's Qualitative Content Analysis

Meaning Units	Condensed Meaning Unit	Codes	Categories	Theme
So, my first semester I did a lot of repetition. I try to every day... At least, my minimum goal is to read all the presentations the professor leaves us. After that, I can write stuff or go to the book, read a chapter, but I like to at least recall... All single days, I read all the presentations as fast as I can. Not like really in deep, but at least read them. Then I go to the book, or start writing and go over them again.	Deliberate repetition	Going over material multiple time	Study skills	Utilization of effective study strategies and methodologies.
I would print off all of the PowerPoints and I have this highlighting method that I underlined. It's like a habit for me. I use different colors and I'll typically change on different parts that I... If it's a whole chunk of PowerPoint slides were on a specific topic, I'll typically leave it. [student showing her example notes]	Techniques to improve memory	Highlights notes	Study habits	
I remember asking, I don't think I ever learnt this, like ever in my ... it had been so long. So, it was really hard to remember how did I study in nursing school and how did I pass college and why am I here? But I think it was just . . . you kind of just have to	Preparing before a class	Read materials before class	Preparation before class	

force yourself through the first couple of
weeks and then you find a groove where
you're reading before . . . I felt that reading
before classes helped.

Description of the Sample

Setting

The setting of this study was the higher education institutions NA students are

attending and the healthcare organizations with which the students are doing their clinical

training. There are a total of 128 NA schools in the US. In 2021, all schools offer a

doctorate degree as an entry level to practice. The curricular sequence of NA schools are

categorized as integrated and front-load programs. Integrated programs combined

didactic and clinical components for the entire length of the program. In contrast, front-

loaded programs offer most didactic course at the beginning of the curriculum and some

courses offered in conjunction with clinical training. The NA program last between 36–

40 months and all students are full time students.

Participants Demographics

Fourteen students participated in the study. Nine of the participants were female,

and five were male students (see Table 3). Ten of the students were in the age range of

31–40 years old. Eleven of the participants described their ethnicity as Non-Hispanic

White and 21% of the participants were Hispanic or Latino. Five of the students

considered themselves single and the remaining nine were married. Of the nine, five

students were married with children. Those students with children, three had one child

and one student had two children. Of those with children, four students had children that

were less than 5 years of age.

Table 3

Demographic Characteristics of Participants

Characteristics	n	%
Age range		
20–30 years old	4	29
31–40 years old	10	71
41–50 years old	0	0
51–50 years old	0	0
Gender		
Female	9	64
Male	5	36
Ethnicity		
American Indian or Alaska Native	0	0
Hawaiian or other Pacific Islander	0	0
Asian or Asian American	0	0
Black or African American	0	0
Hispanic or Latino	3	21
Non-Hispanic White	11	79
Marital Status		
Single	5	36
Married without kids	4	28
Married with kids	5	36
Married with kids		
Number of kids		
1	3	60
2	2	40
3	0	0
>3	0	0
Age range of kids:		
Below 5 years	4	80
6–9 years	1	20
10–19 years	0	0
> 20 years	0	0

Thirteen students had a baccalaureate degree as the highest degree obtained before starting NA school. Five of the students have 6–10 years of nursing and critical care experience and nine had between 1–5 years nursing and critical care experiences. Of the 14 students, five have been out of school for 7–10 years before starting the NA program. Six students were currently enrolled in a frontloaded program. The critical care setting varied from general ICU to specialized critical care settings. The educational characteristics of the participants are described in Table 4.

Table 4

Educational Characteristics of Participants

Participant	Highest Degree Prior to NA School	Years of Practice as RN before start of NA School	Years of Practice in critical care settings before start of NA School	Years out of school before starting NA school	Type of Critical Care Setting	Type of NA Program
1	BSN	6 –10 years	6–10 years	6–10 years	CCU, Trauma ICU	Front-loaded
2	BSN	1–5 years	1–5 years	1–5 years	ICU, SICU	Front-loaded
3	BSN	6–10 years	6–10 years	6–10 years	CCU, Trauma ICU, Neuro ICU	Integrated
4	DNP	1–5 years	1–5 years	1–5 years	MICU, ER	Front-loaded
5	BSN	1–5 years	1–5 years	1–5 years	Neuro ICU	Integrated
6	BSN	1–5 years	1–5 years	1–5 years	MICU, SICU	Front-loaded
7	BSN	6–10 years	1–5 years	6–10 years	ICU	Integrated
8	BSN	1–5 years	1–5 years	1–5 years	ICU	Integrated
9	BSN	1–5 years	1–5 years	1–5 years	PICU	Integrated
10	BSN	6–10 years	6–10 years	6–10 years	MICU, SICU, Trauma ICU	Integrated

11	BSN	1–5 years	1–5 years	1–5 years	SICU	Integrated
12	BSN	1–5 years	1–5 years	1–5 years	MICU	Integrated
13	BSN	6–10 years	6–10 years	6–10 years	MICU, SICU, Trauma ICU	Front-loaded
14	BSN	1–5 years	1–5 years	1–5 years	PICU	Front-loaded

Findings

After reading and analyzing the 14 transcripts, six themes were constructed.

Factors that influenced academic success during the didactic portion of the NA education

were: (a) utilization of effective study strategies and methodology, (b) transition to deep

learning behaviors, (c) integration of learning styles and technology, (d) consideration of

individual teachers, (e) staying connected, and (f) adjusting to being an NA student. The

following paragraphs provide a thorough description of the themes and direct quotes from

participants to provide dimensions and perspectives of factors influencing academic

success.

Theme 1: Utilization of Effective Study Strategies and Methodologies

The students who achieved academic success during the didactic portion of the

NA program set themselves up for success by using effective study techniques. The

students acknowledged that preparing ahead before class was an effective study strategy

and set up the student for outstanding academic performance. One student explained:

I would look for the information beforehand. So, look through the slides the day

before, what they were going to be presenting. And then, I would review those

slide's information and make sure that I understood what was being taught. (P6)

Furthermore, the students expressed that specific study skills were essential to

meet the demands of the academic tasks. The tremendous information given to the

students during the didactic phase of the program posed a challenge to many students.

The materials provided to the students were concepts beyond the basic nursing

curriculum. Since these types of information and the magnitude of the materials were

new and required in-depth understanding, students described NA school experience as

drinking from a firehose. This comparison was made because students were inundated

with many in-depth and extensive details related to anesthesia practice. Students used a

variety of preferred methods and techniques to ensure success. The participants of the

study identified four study strategies and methodology categories during the interviews.

First, going over the materials multiple times allowed the students to grasp new

and old concepts fully. Deliberate repetition led to new knowledge that can be useful in

mastering and developing a complex understanding of new information. Reviewing and

reading the material multiple times facilitated the students' likelihood of remembering

and recalling new and old information stored in long-term memory. During the first three

semesters of didactic learning, the students reviewed classroom lectures and notes

repeatedly and deliberately to handle challenging tasks and detailed new information.

Frequent and constant reading of the lectures or the course materials was a study skill employed by some students ($n = 8$) to prepare for an examination. One student revealed how he accomplished deliberate repetition during the first semester in the program as follows:

> So, my first semester, I did a lot of repetition. I read all the presentations every day, like not really deep, just reading through them and I highlighted it. Then I started writing the most important things. That's what I did in my first semester. I try to every day. . . . At least, my minimum goal is to read all the presentations the professor leaves us. After that, I can write stuff or go to the book, read a chapter, but I like to at least recall. . . . All single day, I read all the presentations as fast as I could. Not like really in deep, but at least read them. Then I go to the book or start writing and go over them again. (P8)

Reviewing the materials many times and looking at the materials at various time points while studying for an examination were shared by most students ($n = 8$) in the interview. The impact of deliberate repetition on retention and understanding new information was highlighted in the following experience of one participant:

> For me, it's all about repetition. So again, like with the lectures, I usually pull them up on my phone. And so, I have about a 30-minute drive into the hospital. So, I play my lectures in the car on the way to and from the hospital. So, I'm hearing them in the car. And then, I go through the PowerPoint several times, and

I'll listen to the PowerPoints and take notes as I go through. And so, each time I

re-listen, go through the PowerPoint, I'll pick a different color to take notes in.

Because then I can say, okay, the first time, these are the bits of information that

like stuck out to be the first time. Okay. I listened to it the second time; I picked

the different colors. Now I'm writing in blue ink. So now I can write in blue, and

this is what I found the second time. So then, by the third time, I pick a third

color, and there's so much less that's in that third color, but I still find things that

third time that I missed the first time, two times through. (P11)

Second, examinations during the didactic component of the NA program are

administered frequently. The examination frequency varied and the exams were

administered as often as every week. The examination schedule was overwhelming to

some students. The participants acknowledged that they needed to lock in the information

from short-term to long-term memory for retrieval to be academically successful in their

examinations. Cementing these new pieces of information to the long-term memory

required effective memory-retention techniques. To best store information for future

retrieval, students made use of senses to improve memory retention and recall. For

example, one participant (P6) used visual aids to remember information.

I think, in my opinion, this was the change I made in my study tips. Now what I

do is that I am more organized than what I was before. When I study now, I look

at the goals of the presentations, and I have the main topics that repeat, for

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example, signs and symptoms, interventions. I group them, and I group them

because you have seven conditions, all with signs and symptoms. So, I make

tables, a little bit more visual, and then I compare them. So now I study more

organized and comparative, and I see like similarities and differences. This

process allows me to recall and remember while I am taking the test.

Some students ($n = 6$) used a combination of visual and kinetic senses to improve

memory as these methods allowed them to retain and understand new information. The

combination of using auditory and visual senses was explained by one student:

I kind of in the combination; I like auditory. So rehearing things, I'm good with

that. And then visual. So, like going through and rewriting out my notes and

going through the notes again is really helpful. And then it depends really what it

is because if you're talking about skills, for example, when I was doing my OB

rotation, we had extra epidural kits that were sitting in our break room, and I took

some of them home, and I set up a stack of Styrofoam pumps, and I pretended like

I was putting an epidural in the Styrofoam pumps because I needed that repetition

of goodness over and over again. (P11)

Third, making precise and accurate notes before, during, and after a classroom

lecture offered some benefits to academic success. Taking notes stimulated critical

thinking and engaged the student. Taking notes increased the amount of information

learned and reduced time spent studying when preparing for an examination. Students

took notes to identify critical points and understand the topic or recall information while reading the content materials and listening during a lecture. A student (P6) stated that taking notes on what the instructors highlight in the lecture allowed confidence when studying for the examination and recalling information while taking the test.

> I'm a simplistic type of individual. When I have a simplistic pattern to follow, and there's less of a bunch of minutiae, that is easier for me to recall information and stuff like that. So, I think I would most definitely make notes, though, during class on content and stuff that professors would put stomp on or, "Hey, you probably should know this."

Last, one study strategy and method used by students to be successful in the didactic portion of the NA program was managing time appropriately and effectively. Managing time was essential as it improved the student's concentration, overall academic performance, examination grades, and reduced stress. Students planned and organized effectively to include setting schedules allocated for study times and activities in the day. One participant reflected on the importance of managing the time spent in and for school-related activities and activities outside school.

> Well, with anesthesia school, the biggest thing has been to be able to balance outside life and school. What if my husband and I, and the pets, the grocery still need to be picked up, we still have to make dinner, the place needs to be cleaned up. There's. . . . You have to be able to kind of. . . . The thing about me is if those.

. . . Like today, if I don't go grocery shopping, I'm going to freak out tomorrow. It has to be done, like girls, my week isn't going to look great. I know my week is going to go better if I have some order to these types of things. (P9)

Theme 2: Transition to Deep Learning Behaviors

Most participants ($n = 12$) acknowledged that their learning and study behaviors have changed when comparing the same activities during their undergraduate nursing program to the current NA program. All participants agreed that acceptance to NA school came with great honor and pride; however, the reality did not set in until the student began the program. In the first few weeks of NA school, students discerned that NA school was different from nursing school. One student conveyed the realization when he became aware of the reality and expectations when he started the program:

You know you are in CRNA school. It's more than you ever expected. And I think everybody goes in fairly clear-eyed, but you don't really know until you get in the program. That's just the reality of it; until you experience it, you don't know. (P10)

Although the excitement and the determination were evident and palpable during the first few days in NA school, a significant realization was the bulk of new materials given to them at once, and they were expected to know these new materials for an examination, which was administered sooner than expected. Most students considered the

volume of materials to know as overwhelming. This sentiment was expressed by one participant.

> The challenges are when they give you so much information, and then they don't give you any time to test it. It's like the next day; they are already giving you so much more. Like the fire hose, right? The fire hose and all. That was the main challenge. (P4)

Students noted some challenges during the didactic learning to include the amount of new materials and introduction of anesthesia content. With these challenges, students recognized they had to make changes in how they studied to be academically successful. "When I started back up, it was learning how to be a student again," one student said (P9). "And then everything about it has to shift. Your focus shifts because it is not nursing school" (P11). Another participant (P10) also understood that undergraduate school is much different from a graduate-level program: "Graduate school is a whole different beast than undergrad, and there's a lot more that goes into it, I think."

As the students prepared for their first examination in NA school, they recognized the need to transition from surface learning approaches to deep learning approaches. Deep learning approaches have been associated with academic success in higher education. In contrast with surface learning approaches, students practicing deep learning approaches were likely to examine the purpose, meaning, and significance of learning and studying. Hence, students do not memorize new information as isolated and unlinked

facts; they analyzed, synthesized, and critically examined it for long-term understanding. The students begin to link new information to general concepts and principles previously learned for future complex problems or contexts.

To be academically successful during the didactic learning phase, the students acknowledged that NA education primarily required a deeper understanding of basic scientific principles in anatomy, physiology, pharmacology, and applied sciences. The synthesis of new knowledge was an essential foundation in understanding anesthesia principles. One of the factors to academic success in NA education during the didactic component of the program was mastering the essential scientific principles in anesthesia practice as this was the foundation need to comprehend complex contents. The basic anesthesia principles included anatomy and physiology, pharmacology, and physical sciences such as physics and chemistry. One of the basic anesthesia principles revealed during the interview was basic and advanced anesthesia pharmacology. Some of the students indicated that pharmacology was a difficult course during the didactic portion of the program; however, learning the basics of pharmacology and comprehending anesthesia pharmacology is a foundation of ensuring safety in the delivery of anesthetic care:

> I would dare say even more so the pharmacology. I think pharmacology was the most important class that we took in this program to apply in clinical. You need to know what drug to use and how the drug works because the patients have co-

morbidities that we have to take into consideration. We need to know the

anesthesia drugs so that we do not harm anyone, our patients. (P2)

Advanced pharmacology was one of the courses offered during the didactic

learning phase. As an introductory class, it was believed to be a challenging course

because of the bulk of information given to the students:

Pharmacology was probably the toughest one because they cram it in. And I think

it was a fixed full school course. They do three in a semester and three another

semester. So, I was like, "Oh my gosh." And there's 700 slides per month that you

have to go through and test on. (P12)

How the students study for advanced principle complex subjects and materials

varied. The students knew that they needed to develop deep learning approaches when

studying complex anesthesia concepts:

Anesthesia was a completely different beast. And I had to take those notes that I

had to refer back to them a lot. I had to refer back to them a lot and then doing test

questions. And that's how I studied for the harder courses, being the anesthesia

ones. (P2)

One area in which deep learning behaviors was developed is through study

groups. The students formed study groups to bounce ideas. The study groups had

multiple functionalities for academic success. Social interaction, working collaboratively,

and deep learning were some of the benefits of group study. As a form of deep learning

medium, group study allowed the students to understand the meaning and significance of concepts. Also, in a group study, an individual student teaches the other students while they are learning, which is considered a deep learning technique (Alsayed et al., 2021; Dolmans et al., 2015; İlhan Beyaztaş & Senemoğlu, 2015). Students believed that study groups were way of engaging in deep learning techniques as described by one participant:

> The main thing our class did is we all had small groups we met and studied with. I think for me, probably not for everybody, but for me, it was accountability because we each took a lecture, and you were responsible for that lecture. We made outlines of each lecture, and then you had to meet with the group and send it out by a certain time and then meet with them. If anyone had a question, you were responsible for having the conversation. (P5)

Theme 3: Integration of Learning Styles and Technology

The students' learning styles differed, and students combined two or more learning styles as they see fit. Students identified four learning preferences during their didactic learning. These were visual, aural/auditory, read/write, and kinesthetic (VARK) styles. Most of the students ($n = 12$) found that sticking with one mode of learning was not sufficient. Students were flexible in their preferences and combined a multimodal approach to learning depending on what contents they studied or worked on. Two students (P11 & P6) expressed that combining two or more learning style modalities

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when studying for an examination or learning a skill improved retention and mastery of the materials. One of the students stated that a combination of visual and aural modalities suited her:

I kind of in the combination, I like auditory. So rehearing things, I'm good with that. And then visual. So, like going through and rewriting out my notes and going through the notes again is really helpful. And then it depends really what it is because if you're talking about skills, for example, when I was doing my OB rotation, we had extra epidural kits that were sitting in our break room, and I took some of them home, and I set up a stack of Styrofoam pumps, and I pretended like I was putting an epidural in the Styrofoam pumps because I needed that repetition of goodness over and over again. (P11)

The other student acknowledged that recalling information was effectively managed by visualizing the lectures or textbooks and written notes. The participant blended visual and kinesthetic modalities of learning styles. He described the blending of the modalities as follows:

I'm more of a visual type of individual that implants an image in my head of what type of whatever the information is on a PowerPoint slide, in a textbook, on a flashcard, and then I start reading and writing notes that I can remember and have recall and everything else like that. (P6)

Aside from using the VARK modalities in learning information, most of the students ($n = 12$) expressed the need to use technology to supplement learning. YouTube videos, study applications, and anesthesia podcasts were examples of the technology described by the students during the interview. The students disclosed that using YouTube videos was highly beneficial in enhancing their understanding of the subject matter because of content and accessibility. The videos provided supplemental learning for understanding challenging anesthesia concepts as expressed by one student as follows:

I'll also look at journals, look at YouTube videos to make things a little bit more concrete. So, Khan Academy or some other type of YouTube situation can explain it in a different format, a video format, or something like that. (P6)

Free online applications such as Quizlet and flashcard applications were used by most students ($n = 8$) to share information. This learning aid facilitated effective time management as described by a participant.

I would make flashcards and Quizlet and just memorize those. We would make online flashcards on Quizlet, and we would each take a class so that we did not overlap because there wasn't enough time for each to make study tests for every class. (P2)

In addition to YouTube videos and online or smartphone flashcard applications, some students ($n = 6$) listened to anesthesia-related podcasts. The quality content in these

podcasts complemented what the students are learning in the classroom and cemented understanding of the anesthesia complex for long-term utility. One student talked about this experience as follows:

> I use the car for a lot of things, and now that our lectures are over, I frequently listen to podcasts driving in the car based on either the rotation that I'm currently in or if I'm getting prepared for the next rotation, I utilize a lot of podcasts. . . . Like one, they have a few that are really good about peripheral nerve blocks, like landmarks, that kind of thing. So, I would listen to that and from the blocks rotation. Which was like, my blocks rotation was about two hours away. (P1)

Theme 4: Consideration of Individual Teacher

Most students regard teachers as a significant figure in their success. The teacher's mastery of the content, self-efficacy, and engagement plays a significant role in academic success in higher education. To the students, teacher's behavioral engagement with students encouraged belongingness and instilled a sense of confidence. In addition, teachers setting realistic expectations and being a transparent bridged academic success. One student indicated that the faculty were supportive and influential in setting up academic success for students.

> I'd say, I really do think that my program and my director and associate director really just kind of set us up for success. They told us what the . . . realistically, how much we should be studying, and I took that to heart. If they told us outside

of class, you should be studying; around these classes, you should be studying 20 to 30 hours extra. I was like, okay. I divided it up, and I scheduled that time, and I really felt like that led to me being successful. (P1)

Paying closer attention to what the teacher says during classroom times was essential to some students ($n = 5$) for academic success as this allowed the students to understand the materials thoroughly. This point was exemplified by one student who said:

If the teacher would say, you need to look at the PowerPoint. I would make sure I'm right as the PowerPoint. Go through every single slide. Okay. So, when I would go to class, I would have already gone through the PowerPoint three times. So that when in class, it was the fourth time, and I pretty much already understood what they were saying. And then, the teacher would fill in the blanks that I may have had. (P4)

Aside from the relationship established between the teachers and students, some students believed that to pass the examination, they needed to know the teacher and how and what type of test items the teacher will write. One participant illustrated this point as follows:

So, I think it sort of depends on which teacher is teaching our class, because obviously each teacher tests differently and you sort of get to know the way that your teacher tests. Some test more of the book, and some test more off

PowerPoints and things like that. We obviously focus on whichever aspect we think that teacher will focus on, but mostly it's just going over the big topics. (P13)

Another student expressed the same observation regarding the importance of knowing the teacher and how and what type of tests questions are expected:

I'd probably ask, who is teaching the class? Because I think a lot of times, these first years don't know how our teachers will test because they haven't had them yet. And so, I'll be like, if it's so-and-so, then you just really need to hammer down the PowerPoints. Do whatever you need to do, like read it 20 times. Go to a study group and just read over it. (P3)

In addition to knowing the faculty and how the teacher wrote the tests, some students alluded to the fact that small quizzes helped them pass examinations. One student was convinced that small quizzes before extensive examinations prepared students for success. This sentiment is further exemplified by one student's experience:

I really appreciate classes that give smaller quizzes before you have a big exam because it gives you a good idea of how that teacher is going to write their questions. What kind of things are they going to focus on? And so, for me, like our freshman year, during the spring semester, we had an anatomy course, and the first quiz on it was horrible. I had no idea what she was going to ask, how she was going to ask it, what her style of teaching herself? . . . And so, from taking that

quiz, I was able to kind of be like, okay, these are the kinds of questions she asks.

This is how detailed she is. So. This is the kind of studying I need to do. (P11)

Theme 5: Staying Connected

Staying connected was an idea expressed by the majority of the students during the interview. Most of the students ($n = 9$) viewed staying connected as resources integral to their academic success during the didactic learning of the NA program. Participants agreed that these resources are obtained from connections with NA educators and other students. In addition, getting social support from peers and family was another avenue for staying connected.

Once the student was accepted into a NA program, the student networked with other students who were currently enrolled in the program to uncover success strategies. Once admitted to the program, the students stayed connected with the NA faculty and other students. The connection developed during the didactic learning afforded the students assistance, guidance, and resources necessary to academic success. Some students explored assistance from the faculty and other students. One participant reflected on an experience with trying to understand a complex anesthesia material and how meeting with the teacher constructed a clear understanding of the concept:

> If it was still unclear and confusing, or if I need more information, then reach out to faculty and ask them, "Hey, I'm not getting this, can you maybe talk more about this or something the next school day," and see if they can reword it or give

our class a different description of it or something along the lines. And usually, all of us, or for the most part, all my colleagues, have the same type of situation, so if it's confusing to someone, it's probably confusing the following person. (P6)

In a situation when the student failed an examination, seeking help early and immediately was deemed critical. One student (P14) described the situation in which connecting with the available resources was beneficial to academic success: "First and foremost, been there. Been there, done that. Talk to somebody sooner rather than later, your program director, the faculty member whose class it is, your study buddies."

When a student still struggled to understand complex concepts, the student should explore and connect with all the resources available to make every effort to succeed. These resources can be other stdents or colleagues, as illustrated in this statement from one participant:

Because if you're struggling with concepts, then whether it is myself or another student that's at a higher level, one of your classmates, your teacher, you need to find somebody that you can sit down with that can break this down in a way that you can understand. And they are some of the most intelligent people I've ever met, and everything they're saying goes in one ear and out the other. And I'm like, I have no idea what she was saying. And it's just that what, like how they are teaching and how I learn, don't match up. (P11)

Most of the students in the study ($n = 10$) recognized that social integration and social support among classmates played an essential role in their academic performance. Students highlighted the support of classmates during the didactic portion of the program. Getting together with other classmates in the group and providing support were critical in academic success as recounted by one student as follows:

> I think I'm a very social person, so I think having that group of those two boys that I study with, that and being able to support and having an open space where all of us were going through the similar thing, that really meant a lot to me and really encouraged me. (P13)

In addition to staying connected with other students for support, participants addressed the connection with family as a form of support. In this context, the connection with family was redefined by setting boundaries during the didactic learning portion of the program. This connection not only provided support but also highlighted the family's understanding of the challenges the students were facing while NA school. All students characterized the significance of family support. One student mentioned about her supporting and understanding husband during her academic journey:

> He's super understanding. He's super understanding. He got his PS5 as of recently. He plays video games, but I mean, we all. . . . He's the type if I'm like, "You know what? That sounds like a lot of fun, but I can't tonight. Why don't you go?" He's super understanding. I, we were both, I think the type that realized we probably

need some separate time in addition to time together, so it doesn't. . . . It's not

super problematic I guess, for us. It's also a 10-year relationship, so it's not

anything new. Babe, I got to study, okay, he just knows. (P9)

Theme 6: Adjustment to Being a Student

Most participants ($n = 13$) acknowledged that the new environment, higher

expectations, and tons of new information were overwhelming when they started the

program. They admitted the difference in their experiences from their basic nursing

programs in comparison to NA programs. Therefore, the students expressed that timely

adjustment of being a student is fundamental to success. One student described the

adjustment to a student role:

First of all, give yourself some grace. Because first I had been out of school for

six years when I started NA, I think it was five and a half somewhere in there.

And so, when I started back up, it was learning how to be a student again. And

then everything about it has to shift. Your focus shifts because even when I was in

nursing school, I was in nursing school, and I worked full time, and now I could

do that. And so it's having that different perspective and it is an entire life change

and it's going from having two incomes to having one income. (P11)

Once the students started the didactic learning portion of the program, students

realized that NA courses are high stakes and demanding. The need to adjustment timely

is illustrated by one student as follows:

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So now it's like, I've always been the one when school's though, getting a C was never really an issue. So, I was never stressed out. I thought, "Oh, I would definitely have above a C. Even if I don't study, I know I can get above a C." But now, with these anesthesia courses, even if I understand the material, I feel like I typically do. I'm not perfect. There's some stuff that you have trouble understanding. It's like, if I have trouble on a concept and I get an 82, that's considered failing. So that it is a whole new stress, and that is just a new level of demanding. (P2)

Not only did the students get adjusted to the new setting in the school, but also reorganized their lifestyles to the new demands of being a NA student. The students' focus was to study as much as possible to pass a high-stake examination, and hence, the students reorganized schedules to balance study times and family times. In addition to making adjustments as an individual, there were also adjustments made by the family to this new role. Often, the student initiated such a discussion with the family. Many students stated ($n = 9$) they had serious discussion and communication with family regarding the new schedule as depicted in this open communication as follows:

I would say I definitely had to dedicate time to the classes and really think about and plan ahead for pushing everything else out of the way, everything else out in my life. That wasn't just housework or worrying about, what am I going to eat this week but planning with my family and everybody else around to let them know,

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hey, I need everybody to step back because this is my focus, and I found that, if

there were weeks where I tried to, okay, let's have dinner this night. I don't have a

lot going on. (P3)

Adjusting to being a student also meant that the participant makes necessary

modifications when it comes to wellness and self-care. The first few semesters during the

didactic learning phase were stressful to most students. Furthermore, most students

balanced their personal life and study for NA courses to mitigate stress. Reducing stress

during the NA school was exemplified by one of the student's experiences regarding the

stressful first semester and his wellness routine:

I tried to talk to my peers, go to the gym, spend some time with my girlfriend, and

try to get sleep as much sleep as I could. But it still was a very, very challenging

year in my semester. My first semester I had a lot of stress. Eating healthy,

sometimes, when you're stressed, you don't eat well. Balance is about doing some

exercise, not staying in bed staring all day. Go out and watch the sun. Once in a

while, go hang around with some friends. Have some balance. That's what I mean

by balance, not like 24/7 studying. (P8)

Being in NA school was stressful for most students. The students quickly realized

that they needed to adjust to being a student again. Although past experiences in nursing

programs impacted the preparation of being a NA student, students needed to adjust the

way they study and adopt self-care and wellness strategies.

Chapter Summary

Factors that influenced academic success during the didactic portion of the NA education were: (a) utilization of effective study strategies and methodology, (b) transition to deep learning behaviors, (c) integration of learning styles and technology, (d) consideration of individual teachers, (e) staying connected, and (f) adjusting to being an NA student.

Understanding factors affecting academic performance was an initial step in improving academic success rates. The insights of these factors will promote program progression and improve student retention. Furthermore, the experiences of those who are successful during didactic learning will provide information into creating strategies to support students and improve academic performance by individual counseling, remedial actions, and other appropriate interventions. Incoming NA students can adopt the findings of this study to improve academic performance, guide educators in student advising and remediation, and inform institutional efforts to revise the NA curriculum.

CHAPTER V

SUMMARY OF THE STUDY

The purpose of this study was to explore factors contributing to the academic success of NA during the didactic learning of the NA program. This study sought to better understand these factors to help NA educators identify students at risk of failure and address academic success strategies when appropriate early on. Understanding the experiences of NA students and identifying factors that contributed to their success provides insights on how NA students managed these challenges. Similarly, this study intended to know these factors to promote program progression and improve student retention. Furthermore, the study examined the perspectives of those who were successful during didactic learning to provide insights into the adult learner, particularly individuals who are academically and experientially prepared, and to recommend strategies to support students and improve academic performance in NA education through individual counseling, remedial actions, and other appropriate interventions.

This chapter builds upon the data presented in Chapter 4. This chapter analyzes and illuminates the study's findings by discussing how these findings interface with the existing literature. In addition, a discussion of the implications of the findings to NA education, policy, and practice will be addressed. Finally, the chapter culminates with a discussion of the recommendations for future studies.

Study Summary

Several factors influence academic success. Cognitive factors, such as previous academic performance, overall GPA, science GPA, and GRE scores, have been examined in previous studies with varying findings (Cerna & Pavliushchenko, 2015; Crede & Kuncell, 2008; Imus et al., 2017; Jafari et al., 2019; Steinmayr et al., 2019; Yokoyama, 2019). These conflicting results led to studies evaluating noncognitive factors. Noncognitive factors such as self-efficacy, emotional intelligence, internal locus of control, and motivation promise academic success (Collins, 2013; Conner, 2015; Crede & Kuncell, 2008; Ford, 1992; Imus et al., 2017). Studies examining factors influencing academic success in NA education are limited, and evidence representing student perspectives is scarce. Research studies in NA education have primarily focused on examining correlations between admission criteria and completion of the NA program and successful completing of the national certification exam, overlooking factors impacting student success after matriculation to the programs, particularly the didactic portion of the NA curriculum (Burns, 2011; Collins, 2013; Dosch et al., 2008; Hulse et al., 2007; Wilson et al., 2015). In addition to the competitive admission requirements, students' previous academic background and experience may influence academic performance in didactic learning (Imus et al., 2017). With NA education lasting 36 to 40 months, the financial burden plays a significant factor in motivating students to perform better in the academic setting (Imus et al., 2017). Therefore, it is crucial to understand

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what factors contribute to how students manage the challenges of NA, the didactic learning component of the NA program.

The literature in the field of NA education has limited information on academic success in the didactic portion of the program. The didactic learning in NA education is crucial to progression into clinical training as concepts learned in the didactic portion guide safe practice and delivery of anesthesia care during the clinical training. The science of NA education has continuously evolved in examining and evaluating the determinants and predictors impacting academic success. Despite the available literature on academic success in NA education, there is a lack of in-depth understanding of factors influencing academic success during the didactic phase of the academic journey. Identifying these factors from students' perspectives is important as these add a new dimension and a unique context to the body of research on factors that contribute to academic success in the didactic portion of NA education. Therefore, a qualitative descriptive research design was deemed most appropriate. This study design was built upon a post-positivism framework to understand how students manage to pass the didactic portion of NA education and identify the factors contributed to this success.

This research study documented the experiences of NA students concerning academic success during the didactic learning phase of the program. The student perspectives on what factors influenced their academic performance were the essence of this study. By capitalizing on student successes and analyzing their failures, the

knowledge developed from this study acted as a catalyst for change in various NA education areas, including but not limited to admission criteria, development of remediation structures, and creation of support systems to improve academic success.

The researcher interviewed 14 NA students to understand their experiences and perspectives on their viewpoints on what factors affected their academic success in the didactic portion of the NA education. The gap in the NA education literature helped the researcher examine the students' experiences and explore the meanings and interpretations of these experiences. The researcher interviewed the participants using a semi-structured questionnaire. After the audio recording was transcribed verbatim, content analysis was performed in accordance with the guidelines outlined by Granaheim and Lundman (2004). The results showed factors that influenced academic success during the didactic portion of the NA education: (a) utilization of effective study strategies and methodology, (b) transition to deep learning behaviors, (c) integration of learning styles and technology, (d) consideration of individual teachers, (e) staying connected and (f) adjusting to being a NA student.

Discussion of the Findings

Students admitted to CRNA programs have met rigorous academic and clinical excellence requirements in critical care nursing. Nurses matriculated into NA programs were deemed most likely to succeed in an intensive 36 or 40-month curriculum. However, the high attrition rate is of interest to educators as various factors are attributed

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to student's academic performance. The literature suggests that 29% of academic success is attributed to student's intellectual skills, the cognitive component of academic success (Hannon, 2014). The remaining 71% is not entirely understood, although data from studies suggested that academic performance may be influenced by noncognitive factors (Collins, 2013; Conner, 2015; Crede & Kuncell, 2008; Ford, 1992; Imus et al., 2017).

The failure of these highly academically prepared students requires attention from educators. The literature review yielded a wide variety of factors that correlate with academic success in both anesthesia and non-anesthesia programs (Burns, 2011; Crede & Kuncell, 2008). Most data showed variability in factors influencing academic success. However, cognitive factors are the most used variable in many studies (Crede & Kuncell, 2008). Although some of the cognitive variables have impressive predictability, many educators and students shifted their focus and investigated the noncognitive variables to student success. There is a similar interest in the field of NA education. The rigorous admission process placed NA students at a high level regarding cognitive abilities and nursing training.

The research question sought to provide the study participants with the opportunity to share their experiences and identify factors that aided them in completing the didactic portion of the NA curriculum. Data analysis of the participants' experiences led to two significant conclusions. These major conclusions represent the group of factors essential to NA success. The first clusters of factors are timely adjustments and

strategizing study techniques. All participants acknowledged that becoming an NA is a goal they want to achieve. Hence, participants planned their career path to work in an ICU setting, study harder and take challenging courses to maximize a higher GPA, GRE scores, and sit for the CCRN exam before applying to NA school. The students were aware of the competitive admission process, and all participants worked harder to achieve the highest possible credentials when applying to the NA school. Once the participants were accepted into the program, students immediately realized the need to make adjustments to meet the demands of the student role.

The participants started to network with students already enrolled in the NA school and future classmates to gather more information on preparing for school. These interactions are done either in person or through social media. The participants seek these networks with the intent to get knowledge and understanding of the NA education journey. In the past decade, social platforms have emerged to aid in students' academic success. Stadtfeld et al. (2018) noted a strong relationship between networking in academic success and failure. Two hundred twenty-six undergraduate students were evaluated for the impact of networking on students' success on the examination during their first year. They concluded that these social interactions created friendship ties, which resulted in the formation of study groups. The study groups have been considered a strategy that promotes deeper learning essential for academic success.

The study found that feelings of being overwhelmed and stressed is common at the start of NA school. Participants acknowledged that the new environment, higher expectations, extrodinary amounts of new information, new family dynamics, and the financial burden of being in the program contributed to the stress level of the newly matriculated students. These stressors described by the participants are analogous to the three sources of stress in NA education identified in the previous study: academic, clinical, and external (Chipas et al., 2012). The literature reported that sources of stress included new environment, information overload, fear of academic failure, adaptation to instructor teaching styles, loss of income, and social concerns (Chipas et al., 2012; Wildgust, 1986). Stress, in any form, can either have a negative or positive impact on the students' success (Conner, 2015). In a survey of 1,374 NA students, a stress level of 7.2 on a scale of 1–10 was recorded as a daily average of the stress of NA students (Wildgust, 1986). Excessive stress results in detrimental consequences that may hinder student's progression and impair patient safety in the worst-case scenario.

Chipas et al. (2012) asserted that immersion into a new environment increases stress and may create a positive motivation in a learning environment. Chipas et al. (2012) further described the stressful environment where anesthesia knowledge and skills gained, and anesthesia administration occur. Although undergraduate school prepared students for higher education, the coursework in graduate school is more complicated and complex, and expectations are much higher than at the undergraduate level. In a way, the

immersion into the new environment, information overload, social and financial burden are the difficulties and challenges of their academic journey. The students recognized these challenges and immediately made adjustments to adapt to the challenges.

Timely adjustment to the new role as a student is very crucial, thus becomes an important factor to academic success of these students. The students immediately realized that the study technique used in undergraduate nursing school might not be effective in graduate school. Pure memorization of the instructor's digital slides (PowerPoint) may not be enough to pass a high-stake exam successfully. It has been shown that previous academic background influenced the ability of the students to adapt to these challenges (Imus et al., 2017). Another critical factor in the new student role adjustment is the number of years the student has been away from school. This lag in time creates doubt and an lack of confidence when starting a program with cohorts of experientially-prepare critical care nurses and academically prepared students.

As students adjust to their new roles, they start identifying study strategies, including using effective strategies by integrating different learning styles and technology to yield more profound learning. All the participants in the study indicated that adopting study strategies that are appropriate and effective aided them in their academic performance. Within the theme of effective study strategies and methodology, the students brought attention to the following categories: study skills and study habits or behaviors. Crede and Kuncell (2008) described study skills as the ability of the students

to engage in appropriate study strategies and techniques. Also, Crede and Kuncell (2008) further cited the significance of time management and use of appropriate resources as contributors of effective study skills. Study skills are the primary variables in learning that involve learning association, focus, concentration, information processing, selecting main ideas, test strategies, and memorization. The use of effective study skills has been examined in some studies. For example, Khali et al. (2017) evaluated different studies skills and test strategies in 180 medical students. The investigators suggested an association between effective test strategies and study skills and the students' academic performance in the anatomical sciences and USMLE Step 1 examinations (Khali et al., 2017).

Study habits are the ability of the students to engage with regular acts of studying using appropriate study routines in an environment conducive to learning (Crede & Kuncell, 2008). Study habits are a combination of study skills and behaviors. The differences between study skills and study habits are the involvement of problem-solving and critical thinking and engagement of activities that becomes a behavior. Jafari et al. (2019) identified certain beneficial behaviors for students, such as studying in a quiet place, turning off devices and social media feeds, regular rests, and breaks between studying and prioritizing student content as effective means of improving academic performance in class. Another study (Alzahrani et al., 2018) examined study habits such as study time, study partners, source of study, breaks, study interruptions, difficulty

concentrating, study activity, and delayed study. These authors investigated 257 medical students and concluded that high-performing students have healthy study habits compared to low-performing students.

The second cluster of factors is the connection of the students to peers, educators, and family. Data showed that staying connected with these groups of people was essential in establishing the relationship necessary to succeed during the didactic component of the program. All participants addressed the importance of supportive and positive connections or relationships, which led to the creation of support systems and resources. Findings from education and psychological studies suggest that the students who establish, create, and sustain healthy relationships with peers perform better academically (Altermatt, 2016; Mishra, 2020; Xerri et al., 2017). Students take advantage of the connection with peers to gain resources during didactics. Many of the participants formed a study group to bounce back ideas and help each other tackle complex concepts while preparing for high-stakes tests. When questions arise, the availability of peers was essential in the students' academic performance as study groups often lead students to learn more deeply (Sawyer & Berson, 2004). The literature clearly shows that true and effective study groups, rather than social gatherings disguised as study groups, aid in the academic performance of the students. Study groups provide an environment where the students can discuss course materials, question each other, and indulge in providing feedback. The group setting allows the students to form social connections in which the

interactions among the members of the group enhances positive energy, motivation, and accountability.

One benefit of connecting with peers and developing positive social connections is for the students' self-efficacy. Self-efficacy, the belief that an individual has his or her ability to accomplish goals, is a predictor of motivation (Conner, 2015; Doménech-Betoret et al., 2017; Galyon et al., 2011; Imus et al., 2017; Yokoyama, 2019). The motivational levels of the NA students differ depending upon whether the students are in didactic or clinical training. During didactic, there are many sources of motivation from family to personal; however, peer support from connections developed in the classroom and group study plays a role in enhancing the students' motivational levels. The idea that the students are in this together creates that bond and a stronger motivation to succeed. Knowing that students and their peers have the same challenges allows that relationship to be both a support system and a resource. For example, Altermatt et al. (2016) argued that students who can disclose their academic challenges, including failures and success, to other students, are more likely to have a higher academic self-efficacy, the belief that an individual has his or her ability to accomplish goals.

The role of the faculty as a resource related to academic and non-academic support is an essential focal point in the academic success of the NA students during the didactic portion of the program. Many studies have reported the relationship between teachers and students as a significant predictor of academic achievement (Bovill, 2019;

Ma et al., 2017; Xu & Qi, 2019). Students who feel supported by the teacher are more likely to be motivated to succeed. In the present study, some students felt that the relationship between the NA educators and the students motivated them to focus and study harder. For most participants, the teacher-student relationship was a resource for complicated and complex content and tasks.

All participants in this study agreed that staying connected with the family has been crucial to their success. Study participants indicated that making it through the didactic would be difficult without family connections. Family connection has often been linked to academic success in various studies. In research-focused doctoral students, family support has been shown to impact academic persistence and success directly (Breitenbach et al., 2019). Gardner and Gopaul (2012) noted that family support was instrumental during the entire doctoral program. Hlabse et al. (2016) found that family support is vital in the successful progression of a DNP program.

The participants in this study referred to the family as immediate, extended family, and other friends who are not part of the immediate and extended family. The connection with family created a robust support system which developed into the creation of emotional encouragement. This emotional encouragement came in the form of a constant reminder that the students could achieve their goals. It also came in being physically present, such as taking care of children, errands, and other family and household activities. Aside from the support system brought about by connection with

family, one of the most critical findings in this study is the integration of the family in the educational journey. Family integration, how well the family is included in the NA education, is begun before matriculation. When prospective students decide to apply for NA programs, family integration starts. Aside from new roles students encounter, students enter the phase in which students discuss with family the expected changes when starting NA school. This aligns with the findings from Breitenbach et al.'s (2019) study that indicated that family integration is key to academic persistence in doctoral studies.

Conclusion and Implications

The findings generated from this study added to the body of literature on factors that influence academic success in NA students during the didactic portion of the program. To our best knowledge, this is the first study to explore factors influencing academic success during the didactic learning phase of NA education. Six themes identified from this study are: (a) utilization of effective study strategies and methodology, (b) transition to deep learning behaviors, (c) integration of learning styles and technology, (d) consideration of individual teachers, (e) staying connected, and (f) adjusting to being a NA student, which emerged as factors that helped the students managed the intensive didactic courses of NA education. The findings from this qualitative study offer specific implications to NA education, practice, and policy.

Education

      This qualitative study sought to understand the experiences of NA students as they navigate the didactic portion of the NA program and identify factors that contributed to their successful completion of the didactic portion. Despite students' previous academic background, intensive training in NA education has resulted in the realization that students must make timely adjustments to meet the demands and challenges of the program. In this study, students described the need to make timely adjustments as the new role of being a graduate student commenced. One modification students make is readjusting how they study and transition from surface learners to deep learners. The NA program can assist the student in this transition by offering lectures, setting open forums, and allowing discussion regarding study skills and study habits that have been utilized by previous students who were academically successful. For example, strategies described by participants in this study may guide educators to include content on study skills, habits and attitudes, lectures and discussion forums in the curriculum. The lecture and discussion forum can be delivered in a big auditorium/classrooms or smaller sessions. Students meet and interact with upperclassmen and former students, all of whom are academically successful. Group sessions, be it larger or smaller, motivate the new students but also helped them gain insightful information on study strategies that worked for other people and students who have completed the didactic section.

The students developed learning styles appropriate for each course in the didactic portion of the NA program. Regardless of the learning styles, students' ability to learn changes as the students progress in the program. Students incorporate social media platforms and other educational technology apps in their learning. These findings acknowledge the importance of incorporating different educational resources to supplement and augment the currently available educational media. For instance, content should be delivered in a traditional lecture face-to-face format and include a variety of ways, such as simulation and video-assisted learning.

In consideration of the integral role of family as a support system and resource, an implication for education would include meeting with family members and educating them about the highs and lows of NA education, including expectations and milestones. Family integration in NA student success is crucial. One strategy to integrate family in the NA academic journey is to set an open forum of family members in which family of new students can meet families of students near completion of didactic courses and families of graduates who are now practicing CRNA. By helping family of the new students understand expectations and time commitments, these families will understand boundaries, and they may likely to provide the support and resources the students need.

Policy

The findings of this study point to several policy implications. Each NA program sets its admission criteria based on the accrediting body's guidelines for NA admission.

The COA for NA Educational Programs issued guidance on selection of nurses'

admission into the NA program. Admission requirements included a baccalaureate or

graduate degree in nursing or an appropriate major, an unencumbered nursing license,

and a minimum of 1-year full-time critical care experience. Many NA schools include

GPA, science GPA, and GRE/GMAT as additional admission criteria. This study showed

that noncognitive factors had impacted success in the didactic portion of the NA

education. Participants of this study described study skills, habits, attitudes, support from

peers, educators, and family members as vital components of success. These findings

support the consideraton of noncognitive criteria for admission to NA programs.

Programs should revisit and review their admission program and incorporate other means

of predicting success. EI has garnered interest among NA educators. Incorporating such

an EI tool as part of the admission tool may likely assist educators in determining the fit

and readiness of the students to start NA school.

Other findings of this study have implications for NA policy and support a policy

creation and/or revision. Participants in this study addressed the significance of

integrating multimodal learning styles and identifying effective study strategies as factors

impacting their academic performance. These findings support creation or revision of

policy adopting strategies based on various learning styles and institutions of early

academic warning. Participants in this study described how their learning styles changed

based on the course and the semester of the program. Students at the beginning of the

program tend to use learning styles that were effective in undergraduate school. Students then realized that adjustments to the use of multimodal and varying learning styles are needed to meet the demands and challenges of the NA curriculum. The NA program can institute a policy requiring faculty to use multimodal strategies to deliver content. The policy will align with the various learnings styles to enhance student learning.

An early warning policy provides students with early and constructive notice regarding their academic performance. The academic warning policy is a mechanism to notify students of the possibility of unsuccessful academic outcomes. However, it allows students to meet with academic advisors to outline effective academic success strategies.

One study finding was related to how the faculty write test items. Although the teacher-student connection created a positive relationship and resource for the students, the study participants stressed that understanding how the teacher writes test items was crucial. Lecture content on how test items are developed, tested, and evaluated can be offered in the entry anesthesia course to assist students in having a better understanding of how to approach different types of test questions during the didactic portion of the NA program. However, a philosophical question arises as to whether educators promote students to learn how items are created instead of understanding anesthesia concepts.

Practice

This section presents implications for practice relevant to the administration, faculty members, students, and their families. For the administration of the program, the

findings of this study support the idea of providing the students' different modalities of learning. In this study, students expressed external sources such as social media platforms and other electronic applications. The utility of these external resources suggests that students engaged in different ways of learning concepts taught in the classroom. Faculty need to be mindful of having only classroom lectures and consider different types of contents delivery, such as the use of video, simulation, and clinical vignettes.

For nurse educators, study findings support the idea of faculty becoming creative in delivery of courses and situationally aware of the status of the students. CRNA educators may incorporate various types of delivery methods to enhance learning. In addition, CRNA educators should identify students at risk early in the program and initiate processes to ensure improvement in academic performance.

Participants in the study expressed the significance of timely adjustments to meet challenges of the educational process. This finding supports the need for new students to evaluate and conduct a self-assessment of their study skills, habits, and attitudes to align with complex new information given to the students. In addition, the newly matriculated students should establish study groups with similar learning styles for the group's cohesiveness. Last, students need to acknowledge the new student role and its impact on relationships among peers and family members.

Family support is crucial in the success of the NA students during the didactics phase of the program. Support can be in various forms. As a resource, family may be able to lighten the load by accepting and understanding the student's responsibilities.

Recommendations for Further Studies

Recommendations for future studies are evident for NA education, policy, and practice. An important recommendation is to gain additional perspectives of former NA students who are now successful CRNAs to get a complete picture of factors affecting their academic performance in the didactic phase. Although the participants of this study have been in the program for at least 18 months, which is halfway in most programs, having the perspectives of CRNAs who have completed the program will provide new insights into academic success factors, including didactic and clinical training completion. Another recommendation for further research is related to NA policy. The NA program should evaluate other factors to consider for the admission criteria. Although many studies have examined cognitive factors, noncognitive factors have shown promise in predicting academic success.

The findings of this study suggest the significance of utilization of effective study strategies and integration of technologies. Based on these findings, future studies should focus on examining the effectiveness of study skills and habits in NA education to encompass both the didactic and the clinical training phases. In addition, technology such as online platforms or applications should be evaluated for utility in improving academic

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performance in this student group. Another finding of this study is the importance of noncognitive factors influencing academic success in these groups of students. Taking into consideration the noncognitive factors during the admission process is a strong recommendation of this study. Therefore, program administrators should focus on evaluating noncognitive tools used during the admission process, such as the assessment tool on emotional intelligence.

Study Limitation

There are several limitations of the study. Findings of this study cannot be generalized to all NA students who are currently in the didactic learning phase of the NA programs because of the nature of the study design. Inherent to qualitative research design is the condition of generalizability of the findings. In this study, the findings were based on the experience from 14 participants and what they considered as the factors that influenced their academic success during the didactic learning phase of NA program. In addition, educators and students intending to generalize the findings of the study to their academic institutions should consider the strategies employed while maintaining scientific rigors throughout the conduct of the study.

One of the limitations of the study is inability to link the findings of the study between socioeconomic factor and academic performance of the participants. Several studies have concluded that socioeconomic and demographic background have correlated to academic success. However, analysis of the data obtained from 14 transcripts did not

show any correlation to academic success because no categories and themes related to socioeconomic and demographic background emerged from the collected data.

A possible limitation of this study is the characteristics of participants. All 14 participants were students who were successful in their didactic learning phase. Students who were not academically successful or who were unsuccessful during their first attempt in NA education may add new insights to the factors influencing academic success. Last, there was no analysis of the comparison between what students in the front-loaded and integrated program consider as the factors that influenced their academic performance. Although, participants of the study did not delineate their experiences based on whether they are from front-loaded and integrated program, the clinical components of the NA curriculum add new information and new skills that may affect the student's academic performance.

Chapter Summary

Academic success is influenced by a combination of cognitive, noncognitive, and sociodemographic factors. In the didactic phase of NA education, noncognitive factors have shown to be a driver to academic performance of these students. The findings of this study added new dimensions and perspectives to the body of research in NA education. The findings have implications for NA education, policy, practice, and future studies. Stakeholders involved in students' academic success during the didactic phase of the NA

curriculum may be able to develop plans to address factors contributing to academic

journey.

REFERENCES

Alsayed, S., Alshammari, F., Pasay-an, E., & Dator, W. (2021). Investigating the learning approaches of students in nursing education. *Journal of Taibah University Medical Sciences*, *16*(1), 43–49. https://doi.org/10.1016/j.jtumed.2020.10.008

Altermatt, E. (2016). Academic support from peers as a predictor of academic self-efficacy among college students. *Journal of College Student Retention: Research, Theory & Practice*, *21*(1), 21–37. https://doi.org/10.1177/1521025116686588

Alyahyan, E., & Düştegör, D. (2020). Predicting academic success in higher education: Literature review and best practices. *International Journal of Educational Technology in Higher Education*, *17*(3). https://doi.org/10.1186/s41239-020-0177-7

Alzahrania, S. S., Park, Y. S., & Tekian, A. (2018). Study habits and academic achievement among medical students: A comparison between male and female subjects. *Medical Teacher*, *40*(51), 51–59. https://doi.org/10.1080/0142159X.2018.1464650

American Association of Nurse Anesthesiology. (2019a, August 8). *Certified registered nurse anesthetists' fact sheet*. https://www.aana.com/membership/become-a-crna/crna-fact-sheet

American Association of Nurse Anesthetists. (2019b). *Education of nurse anesthetists in the United States - At a Glance*. https://www.aana.com/membership/become-a-crna/education-of-nurse-anesthetists-in-the-u.s

Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence, & J. T. Spence (Eds.), *The Psychology of Learning and Motivation: Advances in Research and Theory* (pp. 89–195). Academic Press. (Reprinted from n.d.)

Baddeley, A. D. (2000). The episodic buffer: A new component of working memory? *Trends in Cognitive Sciences*, *4*, 417–423. https://doi.org/10.1016/S1364-6613(00)01538-2

Baddeley, A. D., & Hitch, G. J. (1974). Working Memory. In G. A. Bower (Ed.), *The Psychology of Learning and Motivation* (pp. 47–89). Academic Press.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.

Benson, G., Ploeg, J., & Brown., B. (2010). A cross-sectional study of emotional intelligence in baccalaureate nursing students. *Nurse Education Today*, *30*(1), 49–53. https://doi.org/10.1016/j.nedt.2009.06.006

Berwick, D. M., Nolan, T. W., & Whittington, J. (2008). The triple aim: Care, health, and cost. *Health Affairs*, *27*(3), 759–769. https://doi.org/10.1377/hlthaff.27.3.759

Biggs, J. B. (1989). Approaches to the enhancement of tertiary teaching. *Higher*

    Education Research & Development, *8*(1), 7–25.

    https://doi.org/10.1080/0729436890080102

Bliss, L. B., & Mueller, R. J. (1993). An instrument for the assessment of study behaviors

    of college students. *Reading Research and Instruction*, *32*(4), 46–52.

    https://doi.org/10.1080/19388079309558132

Bouffard, L. (2017). Duckworth, a. (2016). grit. the power of passion and perseverance.

    toronto: Harpercollins. *Revue Québécoise de Psychologie*, *38*(1), 285.

    https://doi.org/10.7202/1040080ar

Bovill, C. (2019). Co-creation in learning and teaching: The case for a whole-class

    approach in higher education. *Higher Education*, 79(6), 1023–1037.

    https://doi.org/10.1007/s10734-019-00453-w

Bradshaw, C., Atkinson, S., & Doody, O. (2017). Employing a qualitative description

    approach in health care research. *Global Qualitative Nursing Research*, *4*, 1–8.

    https://doi.org/https://dx.doi.org/10.1177%2F2333393617742282

Breitenbach, E., Bernstein, J., L Ayars, C., & Tierney Konecny, L. (2019). The influence

    of family on doctoral student success. *International Journal of Doctoral Studies*,

    14, 761–782. https://doi.org/10.28945/4450

Brookman, D. M. (1989). Maslow's hierarchy and student retention. *NACADA Journal*,

    9(1), 69–74. https://doi.org/10.12930/0271-9517-9.1.69

Burns, S. M. (2011). Predicting academic progression for student registered nurse anesthetists. *AANA Journal*, *79*(3), 193–201.

Cai, W., Pan, Y., Chai, H., Cui, Y., Yan, J., Dong, W., & Deng, G. (2018). Attentional bias modification in reducing test anxiety vulnerability: A randomized controlled trial. *BMC Psychiatry*, *18*(1), 1–9. https://doi.org/10.1186/s12888-017-1517-6

Carrick, J. A. (2010). *The effect of classroom and clinical learning approaches on academic achievement in associate degree nursing students* [Doctoral dissertation, Indiana University of Pennsylvania]. ProQuest. https://eric.ed.gov/?id=ED517238

Cerna, M. A., & Pavliushchenko, K. (2015). Influence of study habits on academic performance of international college students in shanghai. *Higher Education Studies*, *5*(4), 42–55. http://doi.org/10.5539/hes.v5n4p42

Chipas, A., Cordrey, D., Floyd, D., Grubbs, L., Miller, S., & Tyre, B. (2012). Stress: Perceptions, manifestations, and coping mechanisms of student registered nurse anesthetists. *AANA Journal*, *80*(4 suppl), S49–S55.

Ciezar-Andersen, S., & King-Shier, K. (2020). Detriments of a self-sacrificing nursing culture on recruitment and retention: A qualitative descriptive study. *Canadian Journal of Nursing Research*, *53*(3), 233–241. https://doi.org/10.1177%2F0844562120908747

Collins, S. (2013). Emotional intelligence as a noncognitive factor in student registered nurse anesthetists. *AANA Journal*, *81*(6), 465–472.

Colorafi, K. J., & Evans, B. (2016). Qualitative descriptive methods in health science research. *Health Environments Research & Design Journal*, *9*(4), 16–25. https://doi.org/10.1177/1937586715614171

Conner, M. (2015). Self-efficacy, stress, and social support in retention of student registered nurse anesthetists. *AANA Journal*, *83*(2), 133–138.

Council on Accreditation of Nurse Anesthesia Educational Programs. (2019). *Standards for accreditation of nurse anesthesia programs – Practice doctorate, revised October 2019*. https://www.coacrna.org/wp-content/uploads/2020/01/Standards-for-Accreditation-of-Nurse-Anesthesia-Programs-Practice-Doctorate-revised-October-2019.pdf

Cowan, N. (2010). The magical mystery four: How is working memory capacity limited, and why? *Current Directions in Psychological Science*, *19*(1), 51–57. https://doi.org/10.1177%2F0963721409359277

Crede, M., & Kuncell, N. R. (2008). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives on Psychological Science*, *3*(6), 425–453. https://doi.org/10.1111/j.1745-6924.2008.00089.x

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. Sage.

Daugherty, L., Fonseca, R., Kumar, K. B., & Michaud, P.-C. (2010). *Is there a shortage of anesthesia providers in the United States?* RAND Corporation https://www.rand.org/pubs/research_briefs/RB9541.html

DeMarco, M. L., & Tilson, E. R. (1998). Maslow in the classroom and the clinic. *Radiologic Technology*, *70*(1), 91–94.

Dolmans, D. M., Loyens, S. M., Marcq, H., & Gijbels, D. (2015). Deep and surface learning in problem-based learning: A review of the literature. *Advances in Health Sciences Education*, *21*(5), 1087–1112. https://doi.org/10.1007/s10459-015-9645-6

Doménech-Betoret, F., Abellán-Roselló, L., & Gómez-Artiga, A. (2017). Self-efficacy, satisfaction, and academic achievement: The mediator role of students' expectancy-value beliefs. *Frontiers of Psychology*, *9*, 1193. https://doi.org/10.3389/fpsyg.2017.01193

Donnelly, G. (2005). The essence of advanced nursing practice. *The Internet Journal of Advanced Nursing Practice*, *8*(1), 1–7. https://print.ispub.com/api/0/ispub-article/6212

Donthi, K. (2012). *Emotional intelligence, adjustment and academic performance: A quantitative research.* Lap Lambert Academic Publishing.

Doody, O., & Noonan, M. (2013). Preparing and conducting interviews to collect data. *Nurse Researcher*, *20*(5), 28–32. https://doi.org/10.7748/nr2013.05.20.5.28.e327

Dosch, M. R., Jarvis, S., & Schlosser, K. (2008). Attrition in nurse anesthesia educational

    programs as reported by program directors: The class of 2005. *AANA Journal*,

    76(4), 277–281.

Duncan, T. G., & McKeachie, W. J. (2005). The making of the motivated strategies for

    learning questionnaire. *Educational Psychologist*, *40*(2), 117–128.

    https://doi.org/10.1207/s15326985ep4002_6

Elo, S., & Kyngas, H. (2008). The qualitative content analysis process. *Journal of*

    Advanced Nursing, *62*(1), 107–115. https://doi.org/10.1111/j.1365-

    2648.2007.04569.x

Entwistle, N., McCune, V., & Tait, H. (2013). *Approaches and Study Skills Inventory for*

    Students (ASSIST) (incorporating the Revised Approaches to Studying Inventory -

    RASI). ResearchGate.

    https://www.researchgate.net/publication/260291730_Approaches_and_Study_Sk

    ills_Inventory_for_Students_ASSIST_incorporating_the_Revised_Approaches_to

    _Studying_Inventory_-_RASI

Epstein, R. M., & Street, R. L. (2011). The values and value of patient-centered care.

    Annals of Family Medicine, *9*(2), 100–103. https://doi.org/10.1370/afm.1239

Ernest, P. (1994). *An introduction to research methodology and paradigms.* University of

    Exeter.

Fetterman, D. M. (1998). *Ethnography: Step by step* (2nd ed.). Sage.

Fonteyne, L., Duyck, W., & De Fruyt, F. (2017). Program-specific prediction of

    academic achievement on the basis of cognitive and non-cognitive factors.

    Learning and Individual Differences, *56*, 34–48.

    https://doi.org/10.1016/j.lindif.2017.05.003

Ford, M. E. (1992). *Motivating humans: Goals, emotions, and personal agency beliefs.*

    Sage.

Frowe, I. (2001). Language and educational research. *Journal of Philosophy of*

    Education, *35*, 175–186.

Galyon, C., Blondin, C., Yaw, J., Nalls, M., & Williams, R. (2011). The relationship of

    academic self-efficacy to class participation and exam performance. *Social*

    Psychology of Education, *15*(2), 233–249. https://doi.org/10.1007/s11218-011-

    9175-x

Gardner, K. S., & Gopaul, B. (2012). The part-time doctoral student experience.

    International Journal of Doctoral Studies, *7*, 063–078.

    https://doi.org/10.28945/1561

Gilchrist, A. A., Cowan, N., & Naveh-Benjamin, M. (2008). Working memory capacity

    for spoken sentences decreases with adult ageing: Recall of fewer but not smaller

    chunks in older adults. *Memory*, *16*(7), 773–787.

    https://doi.org/10.1080/09658210802261124

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing

    research: Concepts, procedures and measures to achieve trustworthiness. *Nurse*

    Education Today, *24*(2), 105–112. https://doi.org/10.1016/j.nedt.2003.10.001

Grove, S., Burns, N., & Gray, J. (2013). *The practice of nursing research: Appraisal,*

    synthesis, and generation of evidence (7th ed.). Elsevier.

Guba, E. G. (1990). *The paradigm dialog*. Sage.

Guba, E., & Lincoln, Y. (1994). Competing paradigms in qualitative research. In N.

    Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117).

    Sage.

Hall, M., Ramsay, A., & Raven, J. (2004). Changing the learning environment to promote

    deep learning approaches in first year accounting students. *Journal of Accounting*

    Education, *13*(4), 489–505. https://doi.org/10.1080/0963928042000306837

Hannon, B. (2014). Predicting college success: The relative contributions of five

    social/personality factors, five cognitive/learning factors, and SAT scores.

    Journal of Education and Training Studies, *2*(4), 46–58.

    https://doi.org/https://dx.doi.org/10.11114%2Fjets.v2i4.451

Haritos, G., Shumway, S., Austin, P., & Ellis, W. (1995). Nurse anesthesia admission

    qualifications. *AANA Journal*, *63*(3), 244–248.

Health Resources and Services Administration. (2017, July 21). *Supply and demand*

    projections of the nursing workforce: 2014-2030. HRSA Health Workforce.

https://bhw.hrsa.gov/health-workforce-analysis/research/projections

Heller, B. R., Oros, M. T., & Durney-Crowley, J. (2000). The future of nursing education. Ten trends to watch. *Nursing and Health Care Perspectives*, *21*(1), 9–13. https://www.healthecareers.com/article/career/future-of-nursing-10-trends-to-watch

Henrichs, B., & Thompson, J. (2009). *A resource for nurse anesthesia educators*. AANA Publishing.

Hinderer, K. A., DiBartolo, M. C., & Walsh, C. M. (2014). HESI admission assessment: An examination scores, program progression, and NCLEX-RN success in baccalaureate nursing: An exploratory study of dependable academic indicators of success. *Journal of Professional Nursing*, *30*(5), 436–442. https://doi.org/10.1016/j.profnurs.2014.01.007

Hlabse, M., Dowling, D. A., Lindell, D., Underwood, P., & Barsman, S. (2016). Supports and barriers to successful progression in a DNP program. *Nurse Educator*, *41*(5), 256–261. https://doi.org/10.1097/nne.0000000000000251

Holahan, C. J., & Moos, R. H. (1991). Life stressors, resistance factors and improved psychological functioning: An extension of stress resistance paradigm. *Journal of Personality and Social Psychology*, *58*(5), 909–917. https://doi.org/10.1037//0022-3514.58.5.909

Hough, M. C. (2008). Learning, decision and transformation in critical care nursing

practice. *Nursing Ethics*, *15*(3), 322–331.

https://doi.org/10.1177%2F0969733007088430

Howell, C. C., & Swanson, C. S. (1989). The relative influence of identified components

of test anxiety in baccalaureate nursing student. *The Journal of Nursing*

Education, *28*(5), 215–220.

http://search.ebscohost.com.ezp.twu.edu/login.aspx?direct=true&db=ccm&AN=1

07534901&site=ehost-live

Hsieh, H. F., & Shannon, S. (2005). Three approaches to qualitative content analysis.

Qualitative Health Research, *15*(9), 1277–1288.

https://doi.org/10.1177%2F1049732305276687

Hulse, J. A., Chenowith, T., Lebedovych, L., Dickinson, P., Cavanaugh, B., & Garrett, N.

(2007). Predictors of student success in the US Army graduate program in

anesthesia nursing. *AANA Journal*, *75*(5), 339–346.

Huntley, C. D., Young, B., Jha, V., & Fisher, P. L. (2016). The efficacy of interventions

for test anxiety in university students: A protocol for a systematic review and

meta-analysis. *International Journal of Educational Research*, *77*, 92–98.

https://doi.org/10.1016/j.ijer.2016.03.001

İlhan Beyaztaş, D., & Senemoğlu, N. (2015). Learning approaches of successful students and factors affecting their learning approaches. *TED EĞİTİM VE BİLİM*, *40*(179). https://doi.org/10.15390/eb.2015.4214

Imus, F. S., Burns, S., & Weglarz, D. M. (2017). Self-efficacy and graduate education in a nurse anesthesia program: A pilot study. *AANA Journal*, *85*(3), 205–216.

Institute of Medicine (IOM) & Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing, at the Institute of Medicine. (2011). *The future of nursing: Leading change, advancing health* (1st ed.). National Academies Press.

Jafari, H., Aghaei, A., & Khatony, A. (2019). Relationship between study habits and academic achievement in students of medical sciences in Kermanshah-Iran. *Advances in Medical Education and Practice*, *10*, 637–643. https://doi.org/10.2147/AMEP.S208874

James, W. (1890). *The principles of psychology*. Henry Holt.

Jaquith, J. M. (1996). The role of short-term memory in academic achievement. *The NACD Foundation*, *10*(6). http://www.nacd.org/wp-content/uploads/2019/05/The-Role-of-Short-Term-Memory-and-Academic-Achievement-1996.pdf

Jones, R. F., & Thomae-Forgues, M. (1984). Validity of the MCAT in predicting performance in the first two years of medical school. *Journal of Medical Education*, *59*(6), 455–464. https://doi.org/10.1097/00001888-198406000-00001

Justice, E. M., & Dornan, T. M. (2001). Metacognitive differences between traditional-age and nontraditional-age college students. *Adult Education Quarterly*, *51*(3), 236–249. https://doi.org/10.1177/074171360105100305

Katz, J. R., Chow, C., Motzer, S. A., & Woods, S. L. (2009). The graduate record examination: Help or hindrance in nursing graduate school admissions? *Journal of Professional Nursing*, *25*(6), 369–372. https://doi.org/10.1016/j.profnurs.2009.04.002

Kenner, C., & Weinerman, J. (2014). Adult learning theory: Applications to non-traditional college students. *Journal of College Reading and Learning*, *41*(2), 87–96. https://doi.org/10.1080/10790195.2011.10850344

Khali, M. K., Williams, S. E., & Hawkins, H. G. (2017). Learning and study strategies correlate with medical students' performance in anatomical sciences. *Anatomical Sciences Education*, *11*, 236–242. https://doi.org/10.1002/ase.1742

Khan, M. S., Mahmood, S., Badshah, A., Ali, S. U., & Jamal, Y. (2006). Prevalence of depression, anxiety and their associated factors among medical students in Karachi, Pakistan. *Journal of the Pakistan Medical Association*, *56*(12), 583–586.

Kim, H., Sefcik, J. S., & Bradway, C. (2017). Characteristics of qualitative descriptive studies: A systematic review. *Research in Nursing and Health*, *40*(1), 23–42. https://doi.org/10.1002%2Fnur.21768

Knowles, M. S. (1970). *The modern practice of adult education: From pedagogy to andragogy*. Prentice Hall Regents.

Knowles, M. S. (1974). Human resources development in OD. *Public Administration Review*, *34*(2), 115–123. https://doi.org/https://www.jstor.org/stable/974934

Knowles, M. S. (1984). *Andragogy in action*. Josey-Bass Publishers.

Knowles, M. S., Holton, E. F., & Swanson, R. A. (2005). *The adult learner: The definitive classic in adult education and human resources development* (6th ed.). Elsevier Inc.

Kowitlawakul, Y., Brenkus, R., & Dugan, N. (2013). Predictors for success for first semester, second-degree bachelor of science in Nursing students. *International Journal of Nursing Practice*, *19*(Suppl. 1), 38–43.

Kuh, G. D., Kinzie, J., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature. Commissioned report for the National Symposium on Postsecondary Student Success: Spearheading a Dialog on Student Success.* https://nces.ed.gov/npec/pdf/Kuh_Team_Report.pdf

Kuncel, N. R., Crede, M., Thomas, L. L., Klieger, D. M., Seiler, S. N., & Woo, S. E. (2005). A meta-analysis of the validity of the Pharmacy College Admission Test (PCAT) and grade predictors of pharmacy student performance. *American Journal of Pharmaceutical Education*, *69*(3), 339–347. https://doi.org/10.5688/aj690351

Lambert, V. A., & Lambert, C. E. (2012). Qualitative descriptive research: An acceptable design [Editorial]. *Pacific Rim International Journal of Nursing Research*, *16*(4), 255–256. https://he02.tci-thaijo.org/index.php/PRIJNR/article/view/5805

Letourneau, N., & Allen, M. (1999). Post-positivistic critical multiplism: A beginning dialogue. *Journal of Advanced Nursing*, *30*(3), 623–630. https://doi.org/10.1046/j.1365-2648.1999.01133.x

Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. Sage.

Lowe, P. A., Grumbein, M. J., & Raad, J. M. (2011). Examination of the psychometric properties of the Test Anxiety Scale for Elementary Students (TAS-E) scores. *Journal of Psychoeducational Assessment*, *29*(6), 503–514. https://doi.org/10.1177/0734282910395894

Lukasik, K. M., Waris, O., Soveri, A., Lehtonen, M., & Matti Laine, M. (2019). The relationship of anxiety and stress with working memory performance in a large non-depressed sample. *Frontiers in Psychology*, *10*, 4. https://doi.org/ 10.3389%2Ffpsyg.2019.00004

Ma, L., Du, X., Hau, K.-T., & Liu, J. (2017). The association between teacher-student relationship and academic achievement in Chinese EFL context: A serial multiple mediation model. *Educational Psychology*, 38(5), 687–707. https://doi.org/10.1080/01443410.2017.1412400

Manieri, E., de Lima, M., & Ghosal, N. (2015). Testing for success: A logistic regression analysis to determine which pre-admission exam best predicts success in an associate degree in nursing program. *Teaching and Learning in Nursing*, *10*(1), 25–29. https://doi.org/10.1016/j.teln.2014.08.001

Markert, R. J. (1984). Using discriminant analysis to identify the noncognitive characteristics of high-achieving medical students. *Psychological Reports*, *55*(1), 331–336. https://doi.org/10.2466/pr0.1984.55.1.331

Maslow, A. H. (1970). *Motivation and personality*. Harper & Row.

Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Forum: Qualitative Social Research*, *11*(3), Art 8. https://doi.org/10.17169/fqs-11.3.1428

Mathis, M. E. (1993). The attrition rate of students in master's level nurse anesthesia programs. *AANA Journal*, *61*(1), 57–63.

Merriam, S. B. (1998). *Qualitative research and case study applications in education*. Jossey-Bass.

Miller, G. A. (1956). The magical number seven plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, *63*(2), 81–97.

Mishra, S. (2020). Social networks, social capital, social support and academic success in higher education: A systematic review with a special focus on 'underrepresented'

students. *Educational Research Review*, 29, 100307.

https://doi.org/10.1016/j.edurev.2019.100307

Morales, L. P. (2015). Relationship between cognitive processes and academic

performance in high school students. *Psychologia. Avances de la Disciplina*, *9*(2),

85–100.

Mthimunye, K., Daniels, F., & Pedro, A. (2018). Predictors of academic performance

among second-year nursing students at a University in the Western Cape. *South

African Journal of Higher Education*, *31*(1), 192–215.

http://hdl.handle.net/10566/5049

Mupinga, E., & Mupinga, D. (2005). Perceptions of international students toward

Graduate Record Examination (GRE). *College Student Journal*, *39*(2), 402–409.

https://eric.ed.gov/?id=EJ714070

Murray, K., Merriman, C., & Adamson, C. (2008). Use of the HESI admission

assessment to predict student success. *Computers, Informatics, Nursing*, *26*(3),

167–172. https://doi.org/10.1097/01.ncn.0000304781.27070.a7

Nagaoka, J., Farrington, C. A., Roderick, M., Allensworth, E., Keyes, T. S., Johnson, D.

W., & Beechum, N. O. (2013). Readiness for college: The role of noncognitive

factors and context. *Voices in Urban Education*, *3*, 45–52.

Ng, T., Eby, L., Dorensen, K., & Feldman, D. (2005). Predictors of objective and

    subjective career success: A meta-analysis. *Personnel Psychology*, *58*(2), 367–

    409. https://doi.org/10.1111/j.1744-6570.2005.00515.x

Nielsen, B., & Harder, N. (2013). Causes of student anxiety during simulation: What the

    literature says. *Clinical Simulation in Nursing*, *9*(11), e507–e512.

    https://doi.org/10.1016/j.ecns.2013.03.003

Ortega, K. H., Burns, S. M., Hussey, L. C., Schmidt, J., & Austin, P. N. (2013).

    Predicting success in nurse anesthesia programs: An evidence-based review of

    admission criteria. *AANA Journal*, *81*(3), 183–189.

Panny, A., Krueger, K., & Acharya, A. (2019). Achieving the 'true' triple aim in

    healthcare. In A. Acharya, V. Powell, M. Torres-Urquidy, R. Posteraro, & T.

    Thyvalikakath (Eds.), *Integration of medical and dental care and patient data*

    (pp. 11–32). Health Informatics.

Parahoo, K. (2014). *Nursing research principles, process and issues* (3rd ed.). Palgrave

    Macmillan.

Pascarella, E., & Terenzini, P. (1980). Predicting freshman persistence and voluntary

    dropout decisions from a theoretical model. *The Journal of Higher Education*,

    51(1), 60–75. https://www.jstor.org/stable/1981125

Patzer, B., Lazzara, E. H., Keebler, J. R., Madi, M. H., Dwyer, P., Huckstadt, A. A., &

    Smith-Campbell, B. (2017). Predictors of nursing graduate school success.

Nursing Education Perspectives, *38*(5), 272–274.

https://doi.org/10.1097/01.nep.0000000000000172

Pintrich, P. R., Smith, D. A., Garcia, T., & McKeachie, W. J. (1991). *A Manual for the Use of the Motivated Strategies for Learning Questionnaire (MSLQ).*

https://files.eric.ed.gov/fulltext/ED338122.pdf

Pirmohamed, S., Debowska, A., & Boduszek, D. (2017). Gender differences in the correlates of academic achievement among university students. *Journal of Applied Research in Higher Education*, *9*(2), 313–324.

https://doi.org/10.1108/JARHE-03-2016-0015

Plant, E., Ericsson, K., Hill, L., & Asberg, K. (2005). Why study time does not predict grade point average across college students: Implications of deliberate practice for academic performance. *Contemporary Educational Psychology*, *30*(1), 96–116.

https://doi.org/10.1016/j.cedpsych.2004.06.001

Polit, D. F., & Beck, C. T. (2016). *Nursing research: Generating and assessing evidence for nursing practice* (10th ed.). Wolters Kluwer Lippincott, Williams & Wilkins.

Reese, C. A. (2002). *An examination of the perceived importance of the applicant's preadmission characteristics as predictive of success in nurse anesthesia graduate education programs* [Doctoral dissertation, State University of New York].

Reiss, N., Warnecke, I., Tolgou, T., Krampen, D., Luka-Krausgrill, U., & Rohrmann, S. (2017). Effects of cognitive behavioral therapy with relaxation vs. imagery rescripting on test anxiety: A randomized controlled trial. *Journal of Affective Disorders*, *208*, 483–489. https://doi.org/10.1016/j.jad.2016.10.039

Reynolds, C. R., & Suzuki, L. A. (2013). Bias in psychological assessment. In *Handbook of Psychology* (2nd ed., pp. 83–113). John Wiley & Sons.

Rickert, J. (2012). Patient-centered care: What it means and how to get there. *Health Affairs Blog*. https://doi.org/10.1377/hblog20120124.016506

Rodríguez-Hernándeza, C. F., Cascallara, E., & Kyndt, E. (2020). Socio-economic status and academic performance in higher education: A systematic review. *Educational Research Review*, *29*, 100305. https://doi.org/10.1016/j.edurev.2019.100305

Rojstaczer, S. (2016, March 29). *Grade inflation at american colleges and universities*. Grade Inflation. https://www.gradeinflation.com/

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, *80*, 1–28. https://doi.org/10.1037/h0092976

Ryan, A. (2006). Post-positivist approaches to research. In *Researching and Writing your Thesis: A Guide for Postgraduate Students* (pp. 12–26). Maynooth Adult and Community Education.

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing & Health*, *23*, 334–340. https://doi.org/10.1002/1098-240X(200008)23:4%3C334::AID-NUR9%3E3.0.CO;2-G

Sandelowski, M. (2002). Reembodying qualitative inquiry. *Qualitative Health Research*, *12*, 104. https://doi.org/10.1177/1049732302012001008

Sarason, I. G., Sarason, B. R., & Pierce, G. R. (1994). Cognitive interference: At the intelligence-personality crossroads. In D. Saklofske & M. Zeidner (Eds.), *International handbook of personality and intelligence* (pp. 2–34). Plenum.

Saravanan, C., Kingston, R., & Gin, M. (2014). Is test anxiety a problem among medical students: A cross sectional study on outcome of test anxiety among medical students? *International Journal of Psychological Studies*, *6*(3), 24–31. https://doi.org/10.5539/ijps.v6n3p24

Sawyer, R., & Berson, S. (2004). Study group discourse: How external representations affect collaborative conversation. *Linguistics and Education*, *15*(4), 387–412. https://doi.org/10.1016/j.linged.2005.03.002

Shapiro, A. L. (2014). Test anxiety among nursing students: A systematic review. *Teaching and Learning in Nursing*, *9*, 193–202. https://doi.org/10.1016/j.teln.2014.06.001

Sharma, S., & Sud, A. (1990). Examination stress and test anxiety: A cross-cultural perspective. *Psychology and Developing Societies*, *2*(2), 183–201. https://doi.org/10.1177/097133369000200203

Shenton, A. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, *22*(2), 63–75. https://doi.org/10.3233/EFI-2004-22201

Spielberger, C. D., & Vagg, P. R. (Eds.). (1995). Test anxiety: A transactional process model. *Test anxiety: Theory, assessment, and treatment* (pp. 3–14). Taylor & Francis.

Stadtfeld, C., Vörös, A., Elmer, T., Boda, Z., & Raabe, I. J. (2018). Integration in emerging social networks explains academic failure and success. *Proceedings of the National Academy of Sciences*, *116*(3), 792–797. https://doi.org/10.1073/pnas.1811388115

Stanley, M. (2015). Qualitative description: A very good place to start. In S. Nayar, & M. Stanley (Eds.), *Qualitative research methodologies for occupational science and therapy* (pp. 21–36). Routledge.

Steinmayr, R., Weidinger, A. F., Schwinger, M., & Spinath, B. (2019). The importance of students' motivation for their academic achievement: Replicating and extending previous findings. *Frontiers in Psychology*, *10*, 1730. https://doi.org/10.3389/fpsyg.2019.01730

Stetto, J. E., Gacksetter, G. D., Cruess, D. F., & Hooper, T. I. (2004). Variables

associated with attrition from Uniformed Services University of the Health

Sciences Medical School. *Military Medicine*, *169*(2), 102–107.

https://doi.org/10.7205/MILMED.169.2.102

Study Skills Assessment Questionnaire. (n.d.). https://www.uhcl.edu/counseling-

services/resources/documents/handouts/study-skills-assessment-questionnaire.pdf

Sullivan-Bolyai, S., Bova, C., & Harper, D. (2005). Developing and refining

interventions in persons with health disparities: The use of qualitative description.

Nursing Outlook, *53*(3), 127–133. https://doi.org/10.1016/j.outlook.2005.03.005

Timer, J. E., & Clauson., M. (2011). The use of selective admissions tools to predict

students' success in an advanced standing baccalaureate nursing program. *Nurse

Today*, *31*, 601–606. https://doi.org/10.1016/j.nedt.2010.10.015

Tobias, S. (1979). Anxiety research in educational psychology. *Journal of Educational

Psychology*, *71*(5), 573–582.

Tracey, T., Allen, J., & Robbins, S. (2012). Moderation of the relation between person–

environment congruence and academic success: Environmental constraint,

personal flexibility and method. *Journal of Vocational Behavior*, *80*(1), 38–49.

https://doi.org/10.1016/j.jvb.2011.03.005

Tulving, E. (1972). Episodic and semantic memory. In E. Tulving & W. Donaldson

(Eds.), *Organization of Memory* (pp. 381–403). Academic Press.

Tynjälä, P., Salminen, R. T., Sutela, T., Nuutinen, A., & Pitkänen, S. (2005). Factors

related to study success in engineering education. *European Journal of

Engineering Education*, *30*(2), 221–231.

https://doi.org/10.1080/03043790500087225

Vermunt, J. D., & Vermetten, Y. J. (2004). Patterns in student learning: Relationships

between learning strategies, conceptions of learning, and learning orientations.

Educational Psychology Review, *16*(4), 359–384.

http://www.jstor.org/stable/23363877

Villa, P. N., Candeias, A. A., Neto, A. S., Franco, M. D., & Melo, M. (2017). Academic

achievement in physics-chemistry: The predictive effect of attitudes and

reasoning abilities. *Frontiers in Psychology*, *8*, 1064.

https://doi.org/10.3389/fpsyg.2017.01064

Vincensi, B. B. (2019). Interconnections: Spirituality, spiritual care, and patient-centered

care. *Asia-Pacific Journal of Oncology Nursing*, *6*(2), 104–110.

https://doi.org/10.4103/apjon.apjon_48_18

Voyer, D., & Voyer, S. D. (2014). Gender differences in scholastic achievement: A meta-

analysis. *Psychological Bulletin*, *140*(4), 1174–1204.

https://doi.org/10.1037/a0036620

Walker, M. E. (2006). *Emotional intelligence and academic success in college* [Doctoral

dissertation, University of Utah].

Wambuguh, O., Eckfield, M., & Van Hofwegen, L. (2016). Examining the importance of

    admissions criteria in predicting nursing program success. *International Journal*

    of Nursing Education Scholarship, *1*, 13. https://doi.org/10.1515/ijnes-2015-0088

Weinstein, C. E., & Palmer, D. R. (2002). *User's manual for those administering the*

    Learning and Study Strategies Inventory. H&H Publishing.

Wendler, C., & Bridgeman, B. (2014). *The research foundation for the GRE® revised*

    general test: A compendium of studies. Educational Testing Service.

Wildgust, B. M. (1986). Stress in the anesthesia student. *AANA Journal*, *54*(3), 272–278.

Willis, D. G., Sullivan-Bolyai, S., Knafl, K., & Cohen, M. Z. (2016). Distinguishing

    features and similarities between descriptive phenomenological and qualitative

    description research. *Western Journal of Nursing Research*, *38*(9), 1185–1204.

    https://doi.org/10.1177/0193945916645499

Wilson, J. T., Gibbons, S. W., & Wofford, K. (2015). Process improvement: Addressing

    attrition from the Uniformed Services University of the Health Sciences nurse

    anesthesia program. *AANA Journal*, *83*(5), 351–356.

Xerri, M. J., Radford, K., & Shacklock, K. (2017). Student engagement in academic

    activities: A social support perspective. *Higher Education*, 75(4), 589–605.

    https://doi.org/10.1007/s10734-017-0162-9

Xu, Z., & Qi, C. (2019). The relationship between teacher-student relationship and

    academic achievement: The mediating role of self-efficacy. *EURASIA Journal of*

Mathematics, Science and Technology Education, *15*(10).

https://doi.org/10.29333/ejmste/105610

Yokoyama, S. (2019). Academic self-efficacy and academic performance in online

learning: A mini review. *Frontiers in Psychology*, *9*, 2794.

https://doi.org/10.3389/fpsyg.2018.02794

York, N. L., & Smith, C. S. (2007). A blueprint for developing an undergraduate critical

care nursing course. *Dimensions of Critical Care Nursing*, *26*(3), 110–116.

https://doi.org/10.1097/01.dcc.0000267820.62742.70

York, T. T., Gibson, C., & Rankin, S. (2015). Defining and measuring academic success.

Practical Assessment, Research & Evaluation, *20*(5), 1–20.

http://pareonline.net/getvn.asp?v=20&n=5

Zeidner, M. (1998). *Test anxiety: The state of the art*. Plenum Press.

Zhou, Y., Graham, L., & West, C. (2016). The relationship between study strategies and

academic performance. *International Journal of Medical Education*, *7*, 324–332.

https://doi.org/10.5116/ijme.57dc.fe0f

APPENDIX A

STUDY RECRUITMENT EMAIL ADVERTISEMENT

Hello,

My name is Tito D. Tubog.

I am a Ph.D. student at Texas Woman's University in the Nursing Department. I am

researching factors influencing NA students' academic success during their didactic and

non-clinical courses, and I am inviting you to participate in this study.

Participation in this research includes an interview, which will take less than 60 minutes.

The interview may be conducted face-to-face, virtual face-to-face, or telephone. The

same interview will be audio-recorded, and the transcript of the interview will be kept

confidential and secured in the researcher's home office. If you participate in this study,

your total time commitment will be at least 90 minutes which will include follow-up.

If you have any questions or would like to participate in the research, I can be reached at

817-913-3441 or ttubog@twu.edu.

Sincerely,

Tito D. Tubog

APPENDIX B

PARTICIPANT SCREENING TOOL

Participant ID Code: _____   Screening interview date: _____

Months in NA program:

☐ >18 months

☐ < 18 months

Type of NA program:

☐ Integrated program

☐ Front-loaded program

Didactic courses successfully completed:

☐ Advanced physiology/pathophysiology

☐ Advanced pharmacology

☐ Anesthesia pharmacology

☐ Basic principles in NA

☐ Advanced principles in NA

☐ Advanced health assessment

☐ Chemistry

APPENDIX C

CONFIRMATION LETTER OF PARTICIPATION

Dear _____:

Thank you for volunteering to participate in the study I am conducting as a doctoral student at Texas Woman's University. The purpose of this qualitative descriptive study is to explore factors contributing to NA students' academic success during the didactic learning of a NA program. A better understanding of these factors of academic success after enrollment in the NA program will help NA educators early identify students at risk of failure during didactic learning and address academic success strategies. Furthermore, the perspectives of those who are successful during the didactic learning will provide insights on the adult learner, particularly individuals who are academically and experientially prepared, and on strategies to support students and improve academic performance in NA education by individual counseling, remedial actions, and other appropriate interventions.

To determine your interview date and time, I have set up a calendar schedule that you can complete to determine the interview time. I will send the link to your email account.

Please be assured that your identity and responses will be treated confidentially, and the information obtained will be used for this study only. Upon completion of the study, you will be allowed to review the gathered information for accuracy if you desire.

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As a reminder, I will email and call you the day before the interview. I look forward to learning about your educational experiences. If you have any immediate questions, you may contact me at 817-913-3441 or by email at ttubog@twu.edu.

I am thanking you in advance.

Sincerely,

Tito D. Tubog

APPENDIX D

RESEARCH CONSENT FORM

Factors Influencing Academic Success Among NA Students

Principal Investigator: Tito D. Tubog ttubog@twu.edu

SUMMARY AND KEY INFORMATION ABOUT THE STUDY

You are being asked to participate in this study conducted by Tito D. Tubog, a PhD Nursing student at Texas Woman's University. The purpose of this study is to explore factors contributing to NA (NA) students' academic success during the didactic learning of a NA program. A better understanding of these factors of academic success after enrollment in the NA program will help NA educators early identify students at risk of failure during the didactic learning and address strategies for academic success. As a result, knowledge of these factors will promote program progression and improve student retention. Furthermore, the perspectives of those who are successful during the didactic learning will provide insights on the adult learner, particularly individuals who are academically and experientially prepared, and on strategies to support students and improve academic performance in NA education by individual counseling, remedial actions, and other appropriate interventions.

You are being asked to participate because you're a current NA student who have completed 18 months of schooling and have successfully completed most of the didactic learning courses in your respective program. As a participant you will be asked to take part in

a virtual interview regarding your experiences on what it takes to be successful during the

didactic portion of the NA curriculum. This interview will be audio recorded, and I will use a

code name to protect your confidentiality. The total time commitment for this study will be about

90 minutes. The greatest risks of this study include potential loss of confidentiality, loss of time

and emotional discomfort. These risks will be discussed below.

Participation in this research study is voluntary, and you may stop participating at any

time. There will be no penalty to you if you decide not to participate, or if you start the study and

decide to stop early. Please feel free to ask the researcher any questions you have about the study

at any time.

PROCEDURES

If you decide to participate in this study, your participation will last approximately 90 minutes.

This 90- minutes includes at least 60 minutes. of interview, and 15 minutes of informed consent

and follow-up if necessary. The interviews will be digitally recorded and transcribed by the

transcriptionist. Your identity will be held in confidence by assigning an identification number to

be used in place of your name. Your ID number will not be linked to your name.

RISKS

The potential risks identified for this study are: loss of confidentiality, loss of time, emotional

discomfort and coercion.

Loss of confidentiality

Maintenance of confidentiality will be considered high priority. Participants will be told

prior to the interview to use aliases for persons or entities who are subjects of the

experiences that they share during the interviews to protect confidentiality. To further

protect confidentiality in the transcripts all proper nouns will be replaced with common

nouns. After all data has been transcribed, the digital audio recordings form student

recording devices will be permanently erased from each device according to specific

device instructions for permanent deletion.

There is a potential risk of loss of confidentiality in all email, downloading, electronic

meetings, and internet transactions.

Loss of time

The interview will occur at a time that is convenient for the participant outside of their

normal class and clinical hours. Participants will be informed of the approximate amount

of time required for participation. Participants may stop participation at any time.

Emotional Discomfort

Participants will be informed that they can choose not to answer questions that make

them

uncomfortable and to only share information that they want to share with the researchers.

Participants may withdraw from the study at any time.

Coercion

Participants will be told that their participation is voluntary and that no recourse will be

taken if they choose not to participate. Participants may withdraw from the study at any

time without penalty.

BENEFITS

There are benefits to participating in this research. First, you may request to have the

results of the study emailed to you. Second, your experience will assist NA faculty to address

academic success concerns early on and mitigate in a timely manner. Last, findings of this study

may influence admission criteria in the future.

QUESTION

You will be given a copy of this signed and dated consent form to keep. If you have any

questions about the research study you should ask the researchers; their contact information is

at the top of this form. If you have questions about your rights as a participant in this research or

the way this study has been conducted, you may contact the TWU Office of Research and

Sponsored Programs at 940-898-3378 or via e-mail at IRB@twu.edu.

CONSENT

By signing this form, you say that you freely and voluntarily consent to participate in this

research study. You have read the information and had your questions answered.

_____

Print Participant's Name

_____   _____

Signature of Participant   Date

_____

Print Name of Person Obtaining Consent

_____   _____

Signature of Person Obtaining   Date

APPENDIX E

SOCIO-DEMOGRAPHIC QUESTIONNAIRE

Participant Code: _____   Date: _____

Demographic Information

Gender: ☐ Female   ☐ Male

Age: ☐ 20-30

        ☐ 31-40

        ☐ 41-50

        ☐ 51-60

Marital status:

☐ Married without children

☐ Married with children

        Number of children: _____

        Age range of children:

        ☐ Below 5 years

        ☐ 6-9 years

        ☐ 10-19 years

        ☐ > 20 years

☐ Single

What is your ethnicity?

☐American Indian or Alaska Native   ☐Black or African American

☐Hawaiian or other Pacific Islander   ☐Hispanic or Latino

☐Asian or Asian American   ☐Non-Hispanic White

☐Other

What is your highest degree prior to NA education?

☐ BA   ☐BS   ☐BSN   ☐MA   ☐MN   ☐MS

☐MSN   ☐DNP   ☐PhD

What is the total number of years of practice as RN before start of NA school?

☐   1-5 years

☐   6-10 years

☐   11-15 years

☐   16-20 years

☐   21-25 years

What is the total number of years of practice in Acute Care Areas before start of NA

school?

☐   1-5 years

☐   6-10 years

☐ 11-15 years

☐ 16-20 years

☐ 21-25 years

How long were you out of school before you started NA school?

☐ 1-5 years

☐ 6-10 years

☐ 11-15 years

☐ 16-20 years

☐ 21-25 years

What are your critical care settings before starting NA school?

☐ CCU ☐ ICU ☐ MICU ☐ Neuro ICU ☐ NICU

☐ PICU ☐ SICU ☐ ER ☐ OR ☐ PACU

☐ Trauma ICU

What are your nursing certifications before NA school?

☐ CCRN ☐ CEN ☐ CSC ☐ CMC

☐ Other (specify): _____

What year are you in NA school? ☐ Year 1　　　　☐ Year 2　　　☐ Year 3

What is the type of NA program?

☐ Integrated Program　　　☐ Front-loaded

APPENDIX F

INTERVIEW PROTOCOL

Factors Influencing Academic Success Among NA Students

_____   _____

Participant Code   Date and Time of the Interview

Pre-Interview Checklist

☐ Introduction of the researcher

- Thanking student for agreeing to participate

- Verify that audio is working

☐ Description of the research study

- Explain the purpose of the study

- Describe the recording and transcription process of the interview

- Discuss with the interviewee the approximate length of the interview

☐ Informed consent

- Remind the participant that their agreement to participate in the study is voluntary and they can change their mind at any time or stop the recording

- If the participant needs to stop or take a break during the duration of the interview, they are able to do so

- Advise the participant that they can choose to not answer a question if they do not feel comfortable

- Signature of the consent forms

☐ Confidentiality

- Participants will be asked to choose a pseudonym in order to protect their personal information

- Inform the participant that there will not be any information that could be identifiable during the interview process or when the information collected is analyzed and reported

- Inform the participant of how all the information collected will be secured, password protected, and stored in a secure location for 36 months to then completely discarded

☐ Permission to begin interview and audio recording

_____

Introductory questions (Intended to establish rapport)

How was your last clinical day?

Interview Questions

1. When you hear the words academic success, what comes to your mind?

2. How do you study?

3. What contributed to your passing the didactic portion of the NA school?

4. What is it like to be done with the didactic portion and starting clinical?

5. What is your view about passing the didactic portion of NA school?

6. What were the challenges during didactic learning phase?

7. Describe a situation where you overcame a challenge?

8. Describe a situation when these "facilitators" helped you pass the didactic phase?

9. How did your past experience prepare you to pass the didactic portion of NA school?

10. What advice do you have for the current students in the didactic portion?

11. What experience in the didactic phase contributed current learning in the clinical phase?

12. Is there anything you wanted to share that I have not asked?

_____

Post-Interview Checklist

☐ Thank the participant

☐ Ask if the participant has questions

☐ Remind of the informed consent forms

☐ Remind of member checking