

Association of Clinical Timing with Self-Efficacy Among Student Registered Nurse Anesthetists

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Abstract

Objectives: To uncover new findings on how best to implement education and training among students in nurse anesthesia programs.

Design and Methods: The target participants are nurse anesthesia students currently enrolled in an accredited Doctor of Nursing Practice (DNP) program that met inclusion criteria. An online survey was distributed to measure self-efficacy using the 10-item Likert-style Schwarzer & Jerusalem General Self-Efficacy Scale. Participants were recruited from a convenience sample of 72 Council of Accreditation (COA) accredited nurse anesthesia programs. Contact was made with program leadership to obtain permission and facilitate the dissemination of the surveys. *Inclusion criteria:* enrolled in accredited DNP program, integrative or non-integrative curriculum as defined by the study and expected graduation date within 12 months. Sample size, n=847 senior nurse anesthesia students. *Independent variable:* curriculum structure (integrative or non-integrative). *Dependent variable:* composite score on General Self-Efficacy Scale, ranging from 10-40.

Primary Results: Mean composite scores on the GSE survey were (33.37 ± 3.23) and (33.91 ± 3.52) for integrative and non-integrative programs, respectively. The mean composite score for participants in a non-integrative curriculum was 0.54 (95% CI, -1.69 to 0.60) higher than mean composite score for participants in an integrative curriculum. The independent samples t-test concludes that there was not a statistically significant difference in the mean composite scores between participants in an integrative and non-integrative curriculum $t(138) = -0.940$, $p = 0.35$, $d = 3.40$.

Principle Conclusions: There is no statistically significant difference between the reported self-efficacy scores among students in both integrative and non-integrative curriculum.

Effects of Curriculum Structure on Students' Self-Efficacy and Learning

Introduction

Nursing education is viewed as an esoteric field of study that draws less attention when compared to areas with tangible outcomes in the clinical setting and affect daily practices. The interest in nursing education stems from the authors' own experiences as student registered nurse anesthetists (SRNAs). The variances among nurse anesthesia programs and disparities among students' experiences and self-reported level of confidence is worth mentioning when considering all students are subjected to the same eligibility requirements for the National Certification Exam (NCE). As nurse anesthesia programs adopt a doctoral curriculum, it is of value to explore whether curriculum changes can be standardized among nurse anesthesia programs.

Background and Significance

To increase the number of highly qualified registered nurses, nursing associations have released statements to expand and promote higher education. In 2007, the American Association of Nurse Anesthetists (AANA) advocated the position that all entry-to-practice, certified registered nurse anesthetists (CRNAs) have a doctorate degree by 2025.¹ In 2009, the Council on Accreditation of Nurse Anesthesia Educational Programs (COA) voted to mandate all nurse anesthesia educational programs to transition to a doctoral framework by January 1, 2022.² The transition to the Doctor of Nursing Practice (DNP) requires an overhaul of the curricula in order to assimilate doctorate level courses. Furthermore, it culminates with the graduation of nurse anesthetists who have undergone clinical training and developed skills to translate evidence into practice via nursing research.

Problem Statement

This transition brings a degree of standardization to CRNA programs. What remains is a degree of variability among the programs' curricula, and therefore, disparities among graduating nurse anesthetists. Major factors in dictating such curriculum design are based on cost, health facility

partnerships, and contractual agreements.³ However, a curriculum with reported high self-perception or efficacy by students is likely to make for a smoother transition to clinical practice because of increased confidence and competency.^{4,5} This translates to improved patient care and patient satisfaction.^{4,6} Despite the benefits to the learner and the patient, there remains limited research to explore students' self-efficacy in relation to integrative versus non-integrative curriculum.³ The fundamental question guiding the literature review addresses whether students, enrolled in integrative and non-integrative nurse anesthesia programs, report a significant difference in self-efficacy upon graduation.

Literature Review

Operative definitions for the purpose of this study were established by the principal investigators. Integrative refers to a curriculum where clinical experiences occur simultaneously with didactic work within the first year of study. Non-integrative refers to a curriculum where didactic work is front-loaded, and clinical experience begins after the completion of the first year of study. Simulation experiences are ubiquitous in nursing education. For this study, simulation experiences are grouped with clinical experiences. Simulation is defined as the replication of real clinical scenarios designed by and under the control of faculty and staff without the involvement of real-life patients.⁷ Simulation experiences include, but not exclusive to learning and developing practical skills such as troubleshooting the anesthesia machine, intubation, placement of invasive monitors on a simulation mannequin, or a mocked, high fidelity clinical scenario.

The purpose in defining these working terms is to keep the study's independent variables consistent and controlled. Additionally, by establishing the criteria for integrative and non-integrative curricula, it helps to simplify and streamline the process of filtering out inappropriate studies during the literature review. With the limited number of available studies, the literature review was narrowed down to 5 prior studies (Table 1) found to be most pertinent to the topic.

The literature search began with the databases Scopus, EBSCO, and CINAHL. The subject search was kept broad to include health related fields such as, “medical school”, “medicine”, and “nursing.” These keywords were then coupled with the following terms: “integrated curriculum”, “curriculum integration”, “frontloading”, “block curriculum”, “Dundee Ready Educational Environment Measure”, “clinical model”, “models, education”, “block OR nonblock” “self-efficacy”, “clinical education”, and “curriculum design.” With more substantial findings using these keywords, an unfiltered literature search was conducted in wider databases including ScienceDirect and PubMed. The selected studies that were most relevant ranged from 2014 to 2020. Due to the finite body of research available, minimal exclusion criteria including “English language only” and “academic journals only” were maintained. With regards to the inclusion criteria, the search was expanded to include all other allied health fields such as medicine, nursing, physical therapy, pharmacy, foreign medical programs, and foreign nursing programs.

The literature review initially focused on SRNAs. However, results were limited, which prompted the revision of the research interest to be more encompassing to health-related fields including medicine and nursing in general. By maintaining minimal exclusionary factors, larger results were produced to fit the time frame of 2014-2020. Furthermore, the articles generated provided a wealth of background information to enrich the current discussion on learning models. If a resulting article was able to augment to the growing literature or the data analysis helped demonstrate one learning model was significantly more beneficial than another, it was included in the data evaluation. The organization of the resulting articles is illustrated in the PRISMA Flow Diagram demonstrated in Figure 1.⁸ The diagram illustrates the process in identifying, screening, and deciding which articles will be subjected to further review and which articles were removed with the appropriate rationale.

The Johns Hopkins Evidence Level and Quality Guide was used to grade the research articles.⁹ The selected articles were subjected to further evaluation and delineated to their components including research questions to be addressed, the setting and sampling, methodology or study design, variables

measured, and outcomes. Thereafter, critical analysis was done to identify the strengths, weaknesses, and any implicit and explicit limitations that may weaken the study. The article was then graded by its level of evidence (level I-IV) and summarized by what conclusions can be drawn from it. The types of study design varied from qualitative, quantitative, and some were a hybrid of both qualitative and quantitative.

Birks et al³ explored nursing students' perceptions on the impact of non-integrative versus an integrative curriculum model on their learning experience and concluded that both have advantages and disadvantages depending on the individual student and their unique situation. The study concluded that block placement was more likely to provide consistency to the students, which was viewed as a critical component to the students' perceptions of self-efficacy and clinical competence. It was also determined that preference for curriculum structure changed as students progressed through the program. It was found that initially students preferred an integrative structure, but as their confidence and skill set grew, non-integrative was perceived as more suitable.

DeSipio et al¹⁰ found early integration was positively received by medical students. At the Cooper School of Rowan University (CMRSU), a pre-clinical curriculum was implemented during the medical students' second year in the program. This is an integrative approach that includes lectures along with learning activities where the students were able to obtain more hands-on experience and practice interacting with patients. This new curriculum design exposed junior medical students to clinical experiences much earlier helped the students better understand the topics taught and helped them apply what they learned in didactics to clinical practice.

Rohatinsky et al⁴ conducted a study including four nursing programs with either an integrative curriculum or non-integrative curriculum. The surprising results highlighted the preference for both models of learning. The distinction was made on the level of seniority among students surveyed. Generally, junior students (considered within their first or second year) preferred integrative due to the

application of theoretical knowledge, work-life balance, the variety in clinical experience, and concurrent feedback by clinical instructors. While senior students (considered within their third and fourth year) preferred non-integrative scheduling because it allowed for consolidation, socialization, and assimilation as they conclude their education and training. It was deduced that both models of learning were beneficial to students' experiences but depended upon their level of seniority.

All articles subjected to evaluation were found to have overlapping limitations. This is to be expected for a research interest that appears to be in its infancy. The first limitation is due to the nature of the research focus. Study designs did not generate strong, definitive correlations between curriculum structure and self-efficacy. The second limitation presents as a natural occurrence to these types of observational studies, which is the subjectivity of study participants. As a consequence of observing a natural phenomenon, the existing curriculum for a program, students are unable to respond to survey questions with full objectivity. The fourth limitation is the lack of generalizability. The studies primarily focused on a homogenous cohort respective to the program and location, thus capping the ability of the study to be applied to other fields of study.

Organizational Assessment

The National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA) and the AANA share a common mission and vision, which is primarily the promotion of patient safety via the enhancement of the credential process for nursing anesthesia programs with the goal of supporting lifelong learning. The mission and vision of this study coincide with the belief that education is the foundation of ensuring that professionals have the knowledge and skills necessary to achieve the highest level of patient safety.

The NBCRNA established the Continued Professional Certification Program in 2016, which places emphasis on continuing education, professional development, and the incorporation of evidence-based practice.¹¹ This suggests that the NBCRNA would be highly interested in the outcomes of this study as

our goals align in promoting education in the realm of anesthesia. The culture of the stakeholders is one of empowerment and promoting autonomy of nurse anesthesia.

Stakeholders play a vital role in this study. Three major stakeholders were identified within this study: nurse anesthesia program directors, faculty board or bodies responsible for curriculum development, and students. Program directors facilitated the distribution of the survey/measurement tool and encouraged student participation. The University of Pennsylvania Nurse Anesthesia program director provided guidance as the faculty advisor and site lead.

The second set of stakeholders deliberate on the executive decision whether to incorporate changes suggested by program directors and students via program evaluations and individual feedback. Part of their responsibility is to determine whether proposed changes are feasible and meet the COA's accreditation criteria. These stakeholders include each school's curriculum committee and the greater organizations responsible for curriculum development such as the American Association of College of Nursing (AACN) and the Commission of Collegiate Nursing Education (CCNE).¹²

Lastly, the most substantial stakeholders are the students. Students are directly affected by changes in their curriculum. Students' self-efficacy, as well as their competence and ability to transition to a professional role is dependent upon the didactic and clinical experiences of their formative years. Students were solicited for their honest reflections on their abilities to cope with various problems through a series of ten survey items related to self-efficacy. It is important to the strength of the results that full participation from all eligible students is achieved. Students in nurse anesthesia programs are the focus of this study.

Study Purpose

This study will add to the growing body of literature within the field of nursing education and focus on how best to implement education and training that will optimize the experiences of students in nurse anesthesia programs. Additionally, it can be used as a tool to guide educators to the model of

learning that is best associated with high self-efficacy. Self-efficacy has been used as a marker to favorable outcomes linked to a professional's ability to provide adequate care for the patient.¹³⁻¹⁵ The goal of this study is to establish a foundation on which a proposed prototypical curriculum can be used to help standardize nurse anesthesia programs as they transition to doctorate programs.

Conceptual and Theoretical Framework

Complexity theory provides the theoretical framework for program evaluation due to the evolving nature of nursing education. Nursing education programs are affected by many factors, both internal and external, such as: accreditation requirements, program faculty and student characteristics, clinical site contracts, influence of stakeholders, and the environment in which the program exists. Nursing and medical education programs are therefore complex systems, given that they are nonlinear and emergent.¹⁶ Furthermore, complexity theory allows one to appreciate the ambiguity and uncertainty of educational programs while evaluating their effectiveness.¹⁶

To understand complexity theory means to understand systems thinking. A system is composed of parts, or rather, a set or pattern of relationships that work together in some fashion.¹⁷ When a system is broken down to its fundamental parts, essential properties and function are lost. For the purpose of this study, an educational program is the system. An educational program, or system, is made up of students, faculty, curriculum, administration, and information technology. This study will evaluate how a curriculum within that system functions and optimizes that system to enhance student learning and the student experience.

Complexity theory builds on the concept of systems thinking. The nurse anesthesia program (system) will be treated as a dynamic, singular complex adaptive system (CAS). It will then be explored how one aspect within this system—the integration of clinical experiences—engages with another aspect of the system, such as the student experience or testing for retention and comprehension. This interaction will clarify current understanding of existing relationships within the system and how

alterations can optimize outcomes that will align with the goals of the CAS. Complexity theory provides the theoretical framework to observe a dynamic system and the flexibility to incorporate and adjust for continuously evolving parts within the CAS.

The Context, Input, Process, Product (CIPP) model is the conceptual model utilized for this study. Its conception stems from the need to examine change within institutions of higher education and how the structure of such institutions influence student learning.¹⁸ The CIPP model, developed by Dr. Daniel Stufflebeam, is essentially a program evaluation model that aims to help guide decision making in program assessments based on the evaluation of four factors.

These four factors to be evaluated include context, input, process, and product (CIPP). The evaluation of CIPP allows for investigators to set forth questions to be addressed, while providing an outline of post-evaluation questions that assess whether the study design was fruitful in achieving goals set forth. The context evaluation brings forward the needs or problems of the phenomenon to be observed and helps stakeholders define the overarching goal. The implementation of the intervention is assessed via input evaluations. During this stage, the design of the intervention is delineated, but is also assessed whether it is defensible and reproducible. Following the input, the process evaluation assesses whether the design was well executed. The culmination of the previous evaluations leads to the product evaluation. This aims to help stakeholders gauge whether outcomes align with the goals originally set forth.¹⁸

The intention of this study is to observe how integrative and non-integrative curriculum design in nurse anesthesia programs affect student reported self-efficacy. The goal is to determine which program design is the most optimal for student learning and postgraduation success. Similar studies have previously implemented the use of the CIPP model in order to change the curriculum that would better benefit the learning of the students. The University of Texas at Austin School of Nursing conducted a study to evaluate the effectiveness of a healthcare organization's reduction program for

healthcare-associated infections using the CIPP model to guide program development.¹⁹ In 2018, Lippe and Carter utilized the CIPP model to evaluate the quality and merit of end-of-life care education in a nursing program.¹⁸ Program evaluation is important and is needed in order to produce confident and safe health care professional. This conceptual model provides a foundation to evaluate whether there is an association between curriculum structure (integrative vs. non-integrative) and graduate nurse anesthesia students' self-efficacy and perceptions on learning. The CIPP model can be used to evaluate for program improvement in addition to new curriculum development.

The CIPP model was applied to help provide the framework as to what factors are to be considered and assessed (Figure 2). This will also aid in the evaluation of the study design following implementation.

Methods

Setting

One hundred and twenty-four COA-accredited programs were identified and categorized based on curriculum structure (integrative, non-integrative, or hybrid) and degree awarded upon graduation (DNP or masters). Of the 124 programs identified, 72 programs met the inclusion criteria of being either integrative or non-integrative and awarding a DNP degree (Table 2). Hybrid and online programs as well as programs that have yet to transition to the DNP were not eligible for inclusion. Programs including online or distance learning prior to COVID-19 (hybrid), were excluded as these programs could potentially introduce confounding factors that would erroneously dilute the data.

Population

The target participants are nurse anesthesia students currently enrolled in an accredited DNP program. Students that participated in the survey were expected to graduate within 12 months from the time the survey was distributed. Senior students develop a degree of independence and critical thinking,

making them appropriate subjects for completion of this survey. The total study population consists of 33 programs, 847 students.

Intervention

The intervention is a survey consisting of the general self-efficacy scale adopted from Jerusalem and Schwarzer.²⁰ The general self-efficacy scale measures self-efficacy through a series of ten statements that have been previously used in comparable studies involving student learning and curriculum evaluation.¹³ An email containing a direct link with the survey tool was sent to program directors of the 72 eligible programs, who then forwarded the survey link to their senior cohort expected to graduate within 12 months. Upon completion of data analysis, the policy change would occur at what is referred to as the “point of intervention” as seen in Figure 3, that outlines how current curriculum design and changes are enacted.¹²

Project Implementation Plan

Early in November, a meeting was scheduled with the University of Pennsylvania nursing library liaison and it was determined that the general self-efficacy scale would be most appropriate to use for the study. There are no financial barriers or violation of intellectual property or copyright infringement upon its application in this study. Following this meeting, a database within Microsoft Excel Spreadsheet was created to organize the programs that were solicited for participation.

On the 17th of November, initial contact with each program director from the 72 eligible programs revealed which program directors were willing to facilitate and encourage engagement of senior students in the survey. The general self-efficacy scale was submitted to the Institutional Review Board (IRB) for approval on the 30th of November. However, a new application was required as this study was not considered a quality improvement project, but rather a research study. A second application for research approval was submitted on the 5th of January in 2021. IRB exemption Category 2 was granted on the 3rd of February.

Following approval to disseminate the survey, a formal DNP proposal was presented to the associated faculty at University of Pennsylvania on the 8th of December. On the 8th of February, an email was sent to program directors with a brief description of the study purpose and a direct link to the survey. The research team met with the analytics consultant on this day to develop a data analysis plan.

In attempt to increase engagement from eligible program directors who remain unresponsive to prior communications, another set of emails was sent directly to the program coordinators and if applicable, assistant program directors, soliciting their help in forwarding the study survey to their senior cohort. In addition, through the period from February 8th and until March 22nd, a general weekly reminder email was sent to all program directors to encourage them to remind their students to fill out the survey. Lastly, another set of emails was sent to participating program directors who have yet to respond with the exact number of senior students in their cohort. This helped in defining the total number of this study's population.

By the end of March 2021, the initial database from Google Forms was imported into an Excel spreadsheet to develop the database and create a data codebook. The Statistical Package for Social Sciences (SPSS) by IBM was used to run the descriptive statistics and ensure that all assumptions have been met to perform a parametric analysis of the data.²² An independent samples t-test was conducted. By the end of April 2021, formal conclusions for stakeholders were inferred from the statistical results. The details of the projected timeline during the implementation phase is found in Figure 5.

Measures

Self-efficacy is analogous with an individual's adaptation to significant life changes and can indicate quality of life at any point in time. The general self-efficacy scale has been used in previous studies over the span of two decades to successfully measure outcomes. Its reliability is evident through its capacity to be translated to other languages without compromise and its strength in measuring self-efficacy is not lost in translation. Furthermore, due to the general terms used in the survey items, it can

be applied to different fields of studies beyond healthcare. The general self-efficacy scale is statistically reliable and valid. Internal reliability of the general self-efficacy scale using Cronbach's alphas is between 0.76 and 0.90.²⁰ The general self-efficacy scale is positively correlated to emotion, optimism, and work satisfaction. According to Jerusalem and Schwarzer, the scale may still undergo statistical analysis if not all items on the scale are addressed.²⁰ If no more than three items are skipped, the general self-efficacy scale remains a viable measure for self-efficacy.

The general self-efficacy scale measures self-efficacy by posing questions that elicit students' perceptions on their ability to critically think and respond to dynamic situations in either an integrative or non-integrative curriculum. The responses will be in the form of a numerical value. The survey consists of 10 items scored on a 4-point Likert-type scale (1= not at all true, 2= hardly true, 3= moderately true, 4= exactly true). Greater values translate to higher perceptions for that item. The individual scores are then summed up to produce a composite score on a scale of 10 to 40. Higher scores indicate a higher sense of self-efficacy, and lower scores indicate a lower sense of self-efficacy.

The general self-efficacy scale is validated for use in the general adult population, including adolescents, but not in children under the age of 12. Explicit permission to utilize the scale in this study is not required. Permission to use and reproduce the general self-efficacy scale is granted given that proper recognition of the source is included in the paper.

Data Management Plan

Data management began with documenting the eligible and ineligible programs for the surveys. Microsoft Excel Spreadsheets was used throughout the implementation period to organize the list of programs based on curriculum structure (integrative, non-integrative, or hybrid) and degree awarded upon graduation (DNP or masters). Along with the program names, also included in the spreadsheet is the name of each program director and contact information, degree granted, type of curriculum design, and participation eligibility per inclusion criteria.

All responses from participants were stored in Google Forms, then imported into a Microsoft Excel spreadsheet. Participants were required to login with a Google email address and password, to ensure that the survey was only completed once per study participant. Identifying information remained anonymous throughout this process. Each completed survey was assigned an arbitrary participant identification number. The data was cleansed, and two dummy variables were created to reflect curriculum type and composite score on the general self-efficacy survey. The codebook was created, and variable labels were assigned to each variable so that all data was numeric. The codebook describes each variable by name according to the following criteria: type of data, units of measurement, and purpose of collecting data and its relationship to other data. The generated Excel spreadsheet was imported into SPSS. SPSS was used to run frequencies and descriptive analyses to find and replace any missing values.

Analysis

The composite scores on the general self-efficacy scale of participants in an integrative program was compared to the composite scores of participants in a non-integrative program using the independent samples t-test given that all assumptions were met.

The first assumption is the dependent variable is continuous, composite scores will range from 10-40. The independent variables are both categorical and are independent of one another, meaning no one program can be considered both integrative and non-integrative per the derived definition by the research team. Next, participants cannot be enrolled in both an integrative and non-integrative program simultaneously. This is reinforced by the operative definitions on what constitutes integrative and non-integrative curricula. For this reason, observations or participants are independent of one another. A student enrolled in one curriculum does not dictate the enrollment of another. The variances between the two independent variables can be assumed to be homogenous, considering the minimum requirements to apply to nurse anesthesia programs. No assumption can be made regarding the

distribution of data whether it will be normally distributed or skewed. Descriptive statistics identified that the data was normally distributed.

In SPSS, descriptive frequencies and histograms were produced to determine normality of distribution. An independent samples t-test was conducted as well as Levene's test for equality of variances and Cohen's d, for effect size.

Sustainability Plan

If the full benefits and positive consequences of this study are to be realized, the sustainability plan is just as paramount to the study as are the results from statistical analysis. A sustainability plan was required to maintain engagement and continuation of data collection. Considering a brief data collection period, maintaining engagement was an obstacle. To address this, the research team established rapport with program directors to maintain interest. Program leadership serves as the conduit to connect with senior students, the study's target participants. If leadership was not engaged in the facilitation of this study, then the survey would not reach the anticipated participants, and the sample size would be smaller. Therefore, follow-up emails to program directors were sent in attempt to recruit more study participants.

Responses from the introductory email revealed growing anticipation for the results of this study. As an amicable community, program directors of nurse anesthesia programs have communicated with one another and shared their excitement for this study. This built anticipation and curiosity regarding the results and prompted dialogue regarding current program structures.

Another obstacle was the reliance of electronic communication. All prospective engagement and participation occurred solely through email correspondence. It is possible program directors could disregard email by an unfamiliar sender address as spam. Furthermore, senior students may not prioritize participation in a survey due to lack of time, investment, or other strenuous circumstances not known to the principal investigators. To counter this potential obstacle, an attention-grabbing subject

title asking for help was used. In addition, weekly emails served as reminders to fill out the surveys over the course of the data collection period.

With regards to future implementation, transition to one curriculum model from the existing model requires not only a paradigm shift, but a change in culture and addressing the expected resistance to such changes. Therefore, the widespread adoption of one curriculum model by all 124 COA accredited nurse anesthesia programs following this study is unrealistic and highly improbable. What will be required of the cultural change and paradigm shift is the acquisition of more data and the continued growth of the body of literature through future nursing education research studies and projects focused on the relationship between students' self-efficacy and curriculum structure. Ideally, the literature will guide leaders in curriculum development towards a single direction and show that integrative or non-integrative is more beneficial to students' self-efficacy and educational experiences, and therefore, becomes a widely accepted understanding that curriculum structure should follow the model that optimizes the students' learning.

Once more literature supports one model of learning, larger stakeholders such as CCNE, AACN, and the AANA may be invested in adopting the more optimal curriculum structure as it aligns with their goals and vision as outlined on their mission statement. Published statements from these organizations will then create a culture that trickles down to stakeholders directly involved with curriculum change such as program directors, faculty committee responsible for the evaluation and development of curriculum, and students. Similar to the onset of the transition to the DNP, AANA released their statement in support of nurse anesthesia programs becoming doctorate granting and later reinforced by the COA's accreditation criteria.

Implications for Practice

The implications of this study directly affect the stakeholders. The results may demonstrate to program directors a need for change or revision of their current curriculum structure. Those involved in

curriculum evaluation at the collegiate level, such as faculty and students on the curriculum evaluation board, may also view the results of this study as having merit. Additionally, the governing boards such as the AACN and CCNE may consider the results useful and provide recommendations and suggestions for curriculum restructuring to the previously mentioned stakeholders.

Data collected from this study will be of value to all individuals who are involved in the development and evaluation of nurse anesthesia educational programs. The implications of this study have the potential to set in motion a need for curriculum restructuring for current anesthesia programs. Alternatively, it may show that there is no difference, and thus, both program models would be equally as effective.

While this study was not necessarily implemented in the clinical realm, there still exists a degree of clinical significance. The difference in timing of entry into clinical residency between integrative and non-integrative curriculum could be up to one year. An additional year of clinical experience can greatly affect one's sense of self-efficacy and confidence in technical skills and ability to critically think through dynamic clinical situations. Incorporating clinical experience early into the curriculum may result in greater feelings of self-efficacy, which ultimately are reflected in the confidence level of the anesthesia professional. This translates to better patient outcomes and higher patient satisfaction.^{5,13} Because the current body of literature regarding curriculum evaluation in nurse anesthesia programs is limited, publication of this study will bring to light the need for more investigation into this phenomenon.

Results

Implementation Process Summary

The implementation phase was delayed as a result of pending IRB approval. The delay did not significantly affect implementation as the dates on the timeline were flexible so that such delays would minimally affect the outcome. The first set of emails including the link to the survey was sent to all 72 eligible programs. By the end of the data collection period, only 38 eligible programs participated in the

study. Table 3 highlights the programs who did not participate and the reason for their nonparticipation. Each Monday from the 8th of February to the 22nd of March, a reminder email was sent out to all 72 programs to prompt program directors to encourage their senior cohort to fill out the surveys. This allotted a total of 7 weeks for students to fill out the surveys.

One anticipated challenge to the study are those eligible programs that remained nonrespondents throughout the implementation period. A 2-week grace period was given to these programs before additional action was taken. The principal investigators then contacted the program coordinators and assistant program directors of the 25 programs who have yet to participate. Following this tactic, a total of 4 programs entered the study population, which resulted in 13 additional participants.

Another challenge during the implementation of the surveys was determining the exact number of senior students in each graduating class. Only the programs with students who have completed the survey were contacted for this information. A total of 25 programs did not respond with the total number of senior students. Consequently, another set of emails tailored to the program directors were sent and the total number of senior students were inquired.

Process Results

By the end of the data collection period, only 38 of the 72 eligible programs forwarded the survey to their senior cohort. Concluding the data collection period, 163 participants completed the survey. Of the 38 participating programs, 5 were removed because students from these programs who filled out the survey reported conflicting responses regarding their eligibility status. For example, students from the same cohort responded both “yes” and “no” to the question “Will you graduate within 12 months?” Additionally, students from the same cohort responded both “yes” and “no” to the question “Will you graduate with a DNP degree?” Due to these conflicting responses, we were unable to determine if these programs, in fact, met our inclusion criteria, which resulted in their disqualification

from the study. This resulted in the removal of 23 participants. The remaining 33 eligible and participating programs resulted in a total study population of 847 students (n=847). Of the 847 students who received the survey, 140 responded. Rosalind Franklin University, University of Southern Mississippi, and University of Arizona were removed during the data cleanse because no students from these schools filled out the survey. This accounts for 63 students of the total 847 participants.

Study Results

An independent samples t-test was conducted. Data are mean \pm standard deviation, unless otherwise stated. Of the 140 participants, 60 were enrolled in an integrative program and 80 were enrolled in a non-integrative program. Mean age of the integrative curriculum group was 29.90 ± 3.63 and mean age of the non-integrative curriculum group was 31.09 ± 4.10 . Median age for the integrative group was 39, and median age for the non-integrative group was 30. Table 4 lists the study participants' primary type of critical care experience in both the integrative and non-integrative group prior to matriculation into an accredited anesthesia program. Table 5 outlines the number of years of critical care experience by group prior to the start of their anesthesia program.

Mean composite scores on the GSE survey were (33.37 ± 3.23) and (33.91 ± 3.52) for integrative and non-integrative programs, respectively, see Figure 5. There was homogeneity of variances for composite scores among participants from both integrative and non-integrative curriculum structure, as assessed by Levene's test for equality of variances ($p = 0.55$).²² The mean composite score for participants in a non-integrative curriculum was 0.54 (95% CI, -1.69 to 0.60) higher than the mean composite score for participants in an integrative curriculum. The independent samples t-test concludes there was not a statistically significant difference in the mean composite scores between participants in an integrative and non-integrative curriculum $t(138) = -0.940$, $p = 0.35$, $d = 3.40$.

Discussion

There is limited literature in the study of nurse anesthesia curriculum development and program evaluation. The intent of this study was to uncover whether there is an association between curriculum structure and reported self-efficacy among nurse anesthesia students. It was initially thought that the timing of clinical placement within the first year of the program may lead to greater self-efficacy, as a result of earlier clinical exposure. However, results of this study shows that there is no statistically significant difference between the reported self-efficacy scores among students in both integrative and non-integrative curriculum. Similarly, Kimhi et al²³ conducted an interventional study that concluded that over time, there was no difference in self-efficacy between groups of nursing students regarding timing of simulation and clinical experience.

The results of this study have considerable implications for nurse anesthesia education and curriculum development. The results show that starting clinical experience in the first year of a doctorate program does not necessarily correlate with greater self-efficacy as students approach graduation. This is important because as the COA requires all anesthesia programs to transition to doctoral programs, some programs may need restructuring of their existing curriculum to meet COA requirements. This is exceptionally important for those on the curriculum development boards within their institutions because it provides raw data that may be useful in deciding whether a didactic front-loaded DNP curriculum is preferential to a curriculum where didactic coursework and clinical fieldwork are integrated.

Several limitations exist for this study. For instance, the operative definitions for the two types of curriculum structures are not universal. An integrative curriculum typically refers to the integration of DNP coursework with anesthesia coursework. A non-integrative curriculum, or front-loaded curriculum, is structured so that all DNP coursework is completed prior to students starting anesthesia coursework and clinical experience. In the literature search the terminology “block” and “nonblock,” was used as it was found to be a more common term in other health-related fields such as pharmacy and medicine. A

block curriculum refers to a curriculum in which students focus on one class at a time. During that time, clinical experience is tailored specifically to that class or specialized area. For the purpose of this study, we developed our own definitions of integrative and non-integrative curriculum which were used to create the grouping variables. Thus, other past or future studies involving curriculum structure may have differing outcomes depending on their methodology of assigning grouping variables.

Another limitation stems from the inherent flaws of the measurement tool and study design. The general self-efficacy survey was previously used in many applications but is not specific in assessing self-efficacy in health-related professions. A survey could have been created and submitted for IRB approval that would address anesthesia specific scenarios. Additionally, surveys only collect data at a single point in time, which makes it difficult to measure change or progress. Therefore, the survey responses only reflect a student's current perception of self-efficacy and confidence in their clinical skill at the time of survey completion.

It is possible that some of the programs may have been incorrectly placed in their respective grouping variable. The research team navigated each educational program's website to locate their curriculum structure and then determined whether the program was integrative or non-integrative, based on the pre-established definitions of curriculum structure. It is possible that the websites were not up to date to accurately reflect the correct curriculum structure that each program is using. There were some instances in which program directors responded that although they were a DNP program, that they did not have a graduating class within the next 12 months, which excluded them from the study. This discrepancy leads us to believe it is possible other discrepancies exist that may have resulted in the lack of statistical significance in the data.

With any study involving surveys, one must consider sampling and response bias. According to the American Association for Public Opinion Research (AAPOR), survey studies typically require a response rate of approximately 60%.²⁴ However, our response rate was 19% prior to the exclusion of 23

participants due to the screening questions regarding eligibility. For this reason, the survey results may not be generalizable because of inadequate sampling of the target population. A total of 60 participants were enrolled in an integrative program while 80 were enrolled in a non-integrative program. Perhaps an equal number of participants from each curriculum structure may have produced different results.

Furthermore, sparking engagement from program directors and their participation in forwarding the survey to their students was seamless but was not without its own challenges. Student engagement is not guaranteed. When students did volunteer to participate, there is no way of knowing how accurate and truthful the responses are. Surveys inquiring on behavior, opinions, or beliefs entails a degree of subjectivity. As a result, it is possible that students scored themselves higher on the self-efficacy scale out of subconscious or conscious bias. In addition, given the time constraints and circumstances a nurse anesthesia student may be under, those who are likely to participate in the survey are more likely to be satisfied with their current standing in the program. It is possible students that are struggling or face repeating courses are likely not to volunteer and disclose their current challenges.

Despite its limitations, the results of this study should not be taken for granted as they contribute to a growing body of literature regarding nurse anesthesia education and curriculum development. The study will need to be reproduced using a measurement tool that is created and tailored towards assessing nursing anesthesia students' education and clinical experience regarding self-efficacy. It would be ideal to achieve a response rate greater than 60%. A longer data collection period and attempts to appeal to students could increase engagement. Future studies could follow-up with these same study participants to assess their self-efficacy after graduation as they start working as a novice CRNA. Additionally, accuracy and confirmation of curriculum structures from program leadership will contribute to the accuracy of categorizing each program curriculum.

Funding & Acknowledgments

Author Contributions: Carrillo, Le Dang, and Vacca had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Conflict of Interest Disclosures: None reported.

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the University of Pennsylvania. All information and materials in this article are the original work of the authors.

Additional Contributions: We thank the following individuals: all the program directors who received emails and took the time to respond stating their inability to participate or their willingness to help launch this study. Special thanks to Richard James, library liaison, of the University of Pennsylvania School of Nursing for assisting with the literature search and measurement tool. Thank you to Bruno Saconi for providing counsel to statistical analysis. Thank you to Dr. John T. Barrett and Dr. Ann L. O'Sullivan for their help in the development of the study and revisions of the manuscript. Thank you to Dr. Dawn E. Bent for her support and guidance throughout the entire process. None of these individuals received any compensation beyond their usual salary.

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Figures

Figure 1. PRISMA Flow Diagram

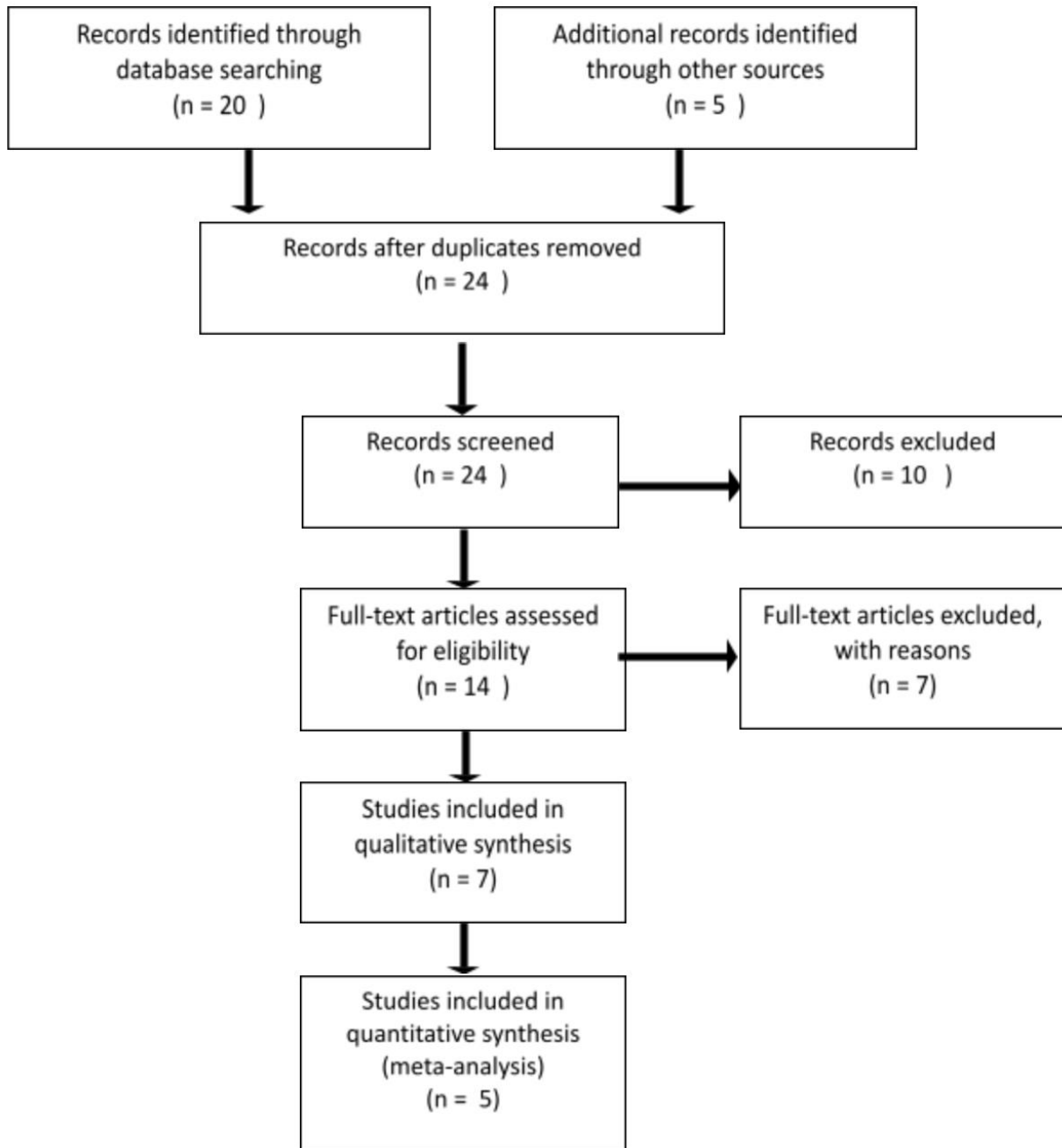


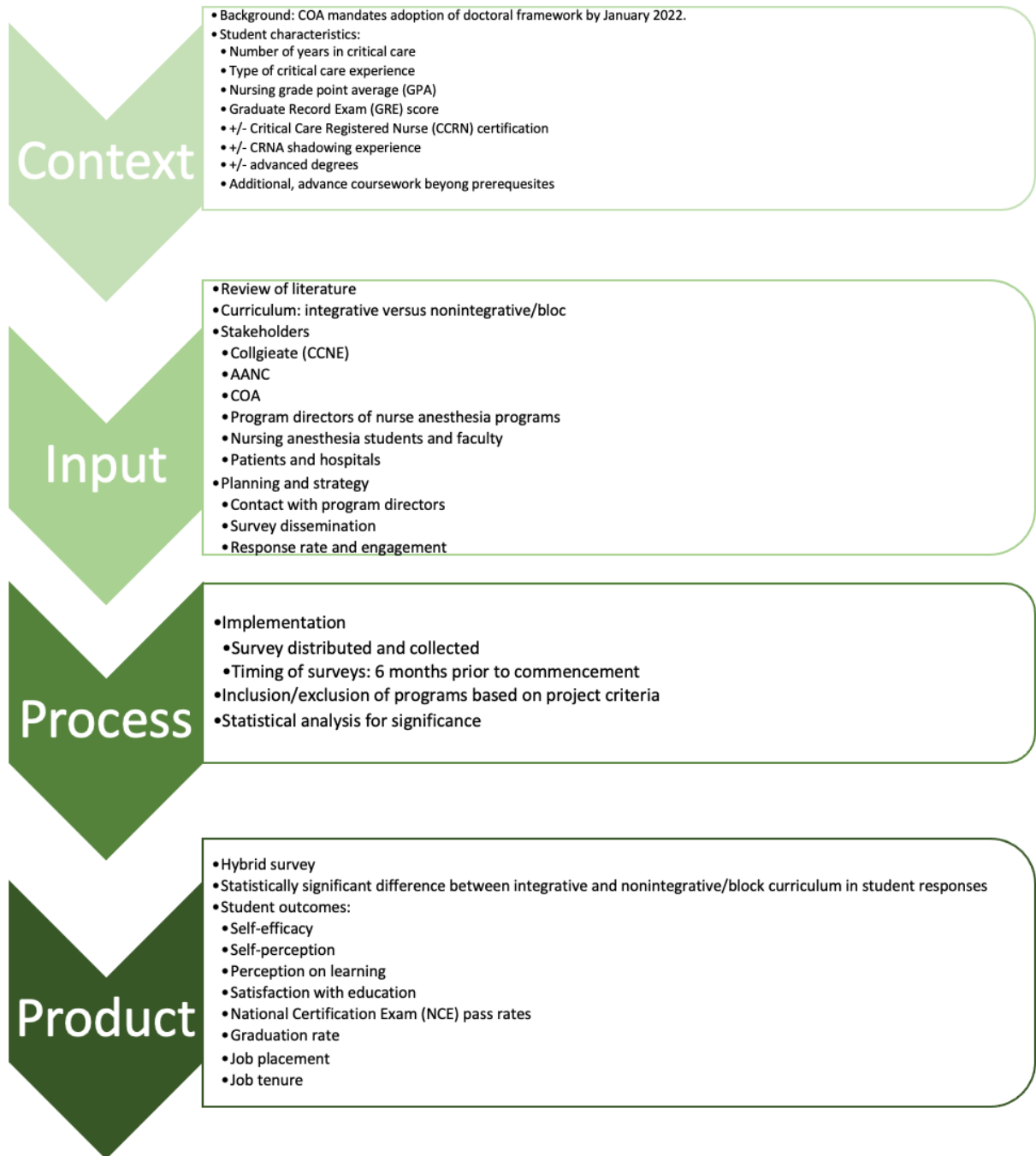
Figure 2. Conceptual Framework for Curriculum Evaluation

Figure 3. Process Flowchart for Curriculum Implementation and Changes¹²

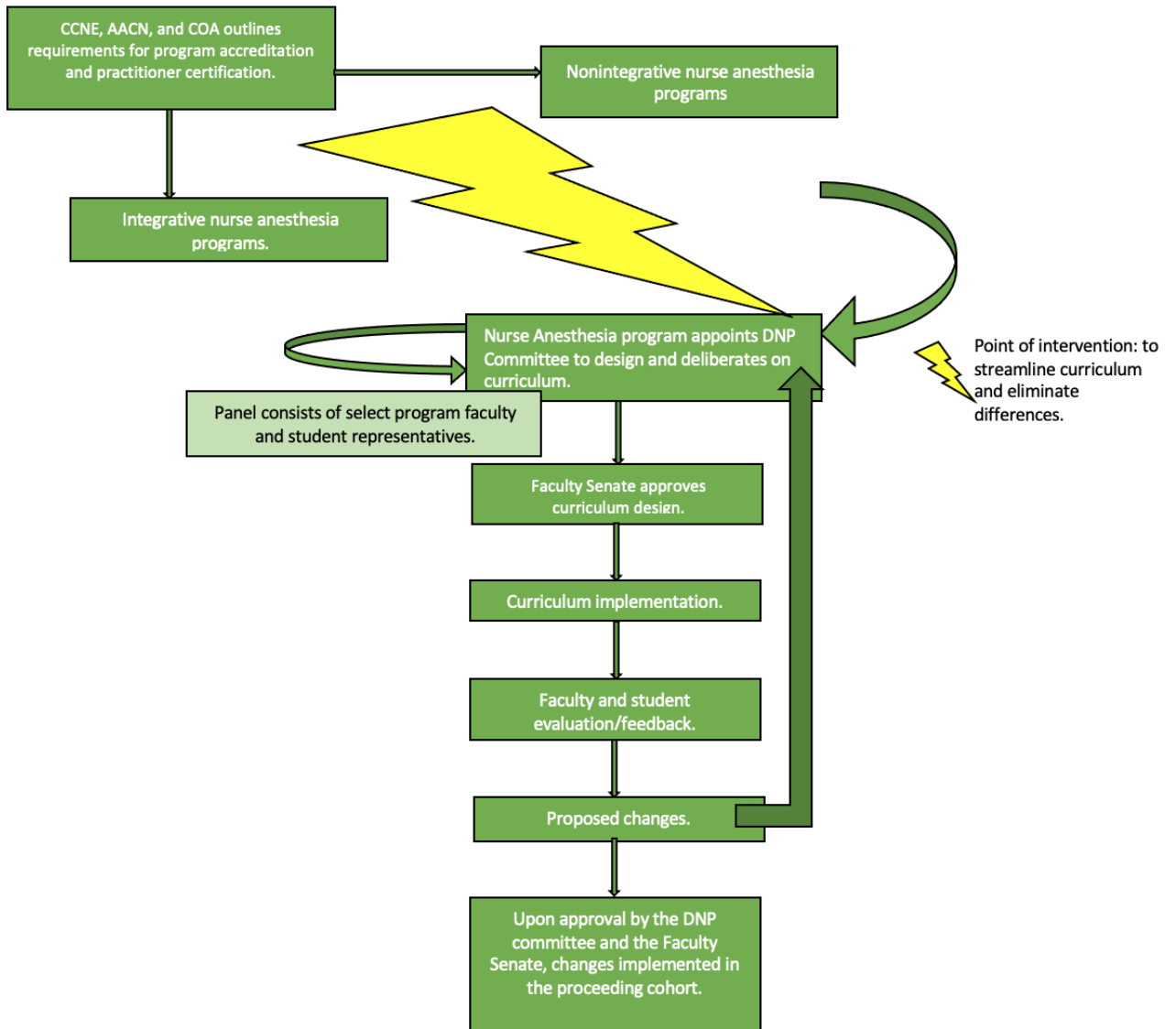


Figure 4. Jerusalem and Schwarzer General Self-Efficacy Scale

	1= Not true,	2= Hrdly true,	3= Moderately true,	4= Exactly true
I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
If someone opposes me, I can find the means and ways to get what I want.	1	2	3	4
It is easy for me to stick to my aims and accomplish my goals.	1	2	3	4
I am confident that I could deal efficiently with unexpected events.	1	2	3	4
Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
I can solve most problems if I invest the necessary effort.	1	2	3	4
I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
When I am confronted with a problem, I can usually find several solutions.	1	2	3	4
If I am in trouble, I can usually think of a solution.	1	2	3	4
I can usually handle whatever comes my way.	1	2	3	4

Figure 5. Project Timeline

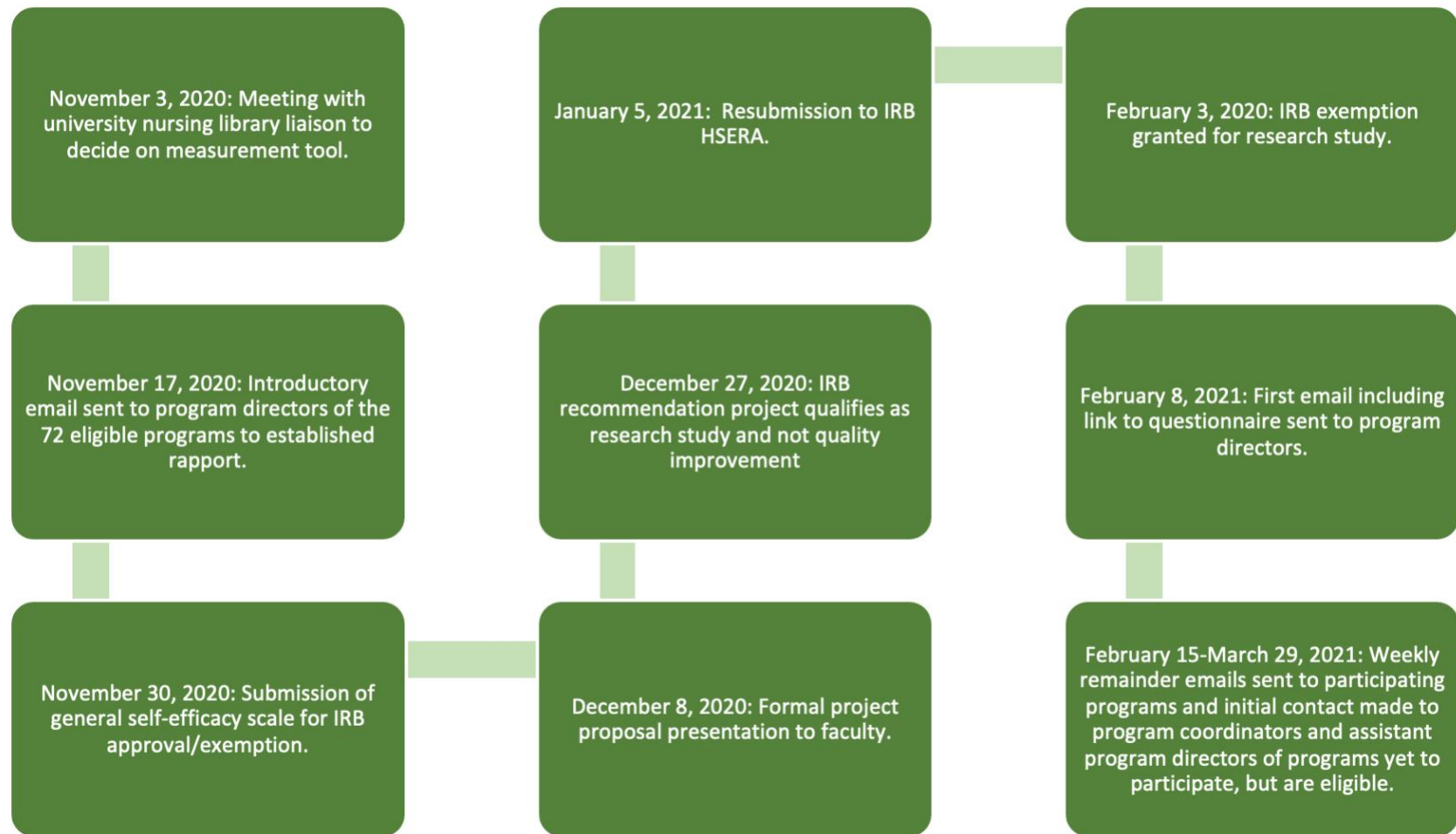
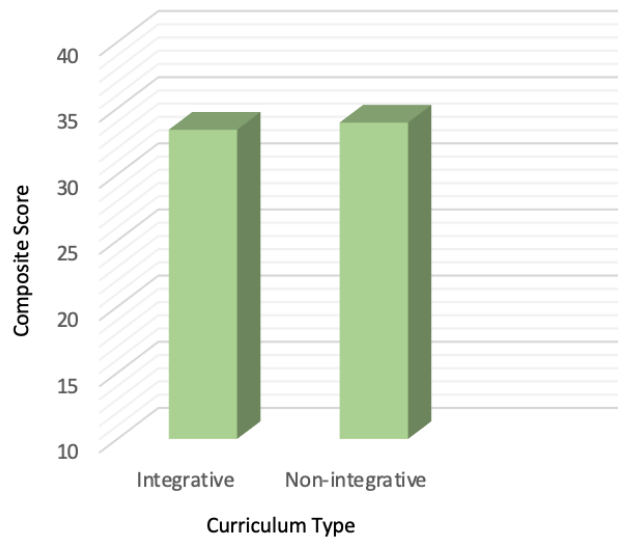


Figure 6. Mean Composite Scores by Curriculum Type



Tables

Table 1. Table of Evidence

Authors, Year, Country	Aim	Sample characteristics	Methodology, study design	Variables and Measures	Major Findings	Conclusions
DeSipio et al., 2018, United States	Question: whether there are benefits of early exposure to patients prior to clerkship rotations for second year medical students.	Setting: CMSRU Sample: 80 medical students Sampling: Each group consists of 8 students with 2 faculty facilitators	Descriptive correlational pilot study Evaluations were given to the students and were collected anonymously. Evaluation A included 11 Likert scale questions were asked, evaluation B included 3- Likert scale questions, along with open-ended questions.	IV: Integrating formal class knowledge with clinical experience early on in medical school DV: 3-point Likert scale with 1 for “strongly disagree to 5 for “strongly agree.”	Response rate: 96% (77/80). Cronbach’s Alpha was 0.7, which suggests that there is an acceptable internal consistency reliability. The Likert scale revealed the mean scores of 4.8/5 for “informative,” 4.7 for “enhance empathy,” and 4.7 for “conductive to learning.”	Students highly recommended that the school included introducing clinical experience early in the program.
Imus et al., 2017, United States	Aim: evaluation of the students’ perception of	Setting: Nurse anesthesia at Midwestern University	Descriptive correlational pilot study to determine the	IV: attending academic classes compared to having academic	Findings: students with a higher amount of self-efficacy do well clinically. Those	Conclusions: This study showed that the clinical preceptors that help

Authors, Year, Country	Aim	Sample characteristics	Methodology, study design	Variables and Measures	Major Findings	Conclusions
	their own independence in learning for academic first year students and clinical second year students	Sample: 66 first- and second-year students Sampling: The survey and data were collected and managed using REDCap electronic data capture tools hosted at http://project-redcap.org/ .16.	relationship between self-efficacy and outcome variables to determine the students' perception. Schwarzer and Jerusalem General Self-Efficacy Scale. The unidimensional scale is designed to determine a person's perception of self-efficacy.	classes and attending clinical rotations DV: first year didactic students and second year clinical students survey responses	students with a lower self-efficacy had a lower academic performance and did not do as well in the clinical setting.	students are in a pivotal position to identify students displaying low self-efficacy.
Rohatinsky et al., 2017, United States	Questions: "What type of clinical model is preferred by students?" "How does the clinical structure influence	Setting: Enrolled nursing students in 4 baccalaureate programs in Western Canada Sample: N=231	Design: Descriptive, exploratory Thematic analysis of qualitative data.	IV: (1) blocked curriculum, (2) unblocked curriculum DV: Response on 91 item Likert scale survey composed of DREEM, BSCPE, and MEAS	Findings: 4 key themes identified for preference for nonblock: (1) application of didactic knowledge with clinical experience (2) work-life balance, (3) variation in patient assignment, (4)	Preference for block vs nonblock curriculum is divided among the experience of students. 1st & 2nd preferred nonblock due to application of theoretical

Authors, Year, Country	Aim	Sample characteristics	Methodology, study design	Variables and Measures	Major Findings	Conclusions
	nursing students' perceived learning?"	Sampling: Examined cohorts from block and nonblock curriculum as enrolled. Students eligible had to have had experienced 1 clinical rotation.	SPSS used for statistical analysis.	Inclusion of free response questions: "Given a choice between block clinical or nonblock clinical, which would you choose? Why?"	<p>appropriate timing of clinical instructor feedback with formative development.</p> <p>5 key themes identified for preference for block: (1) focus on clinical learning, (2) frontloading of didactic, (3) familiarity with clinical site and building rapport with staff, (4) continuity of patient care, (5) amalgamation of clinical judgement and knowledge to help students feel prepared</p> <p>-1st & 2nd year prefer nonblock. -3rd & 4th year prefer block.</p>	<p>knowledge, work-life balance, variety in clinical experience, and concurrent feedback by clinical instructors.</p> <p>3rd & 4th year students preferred block for consolidation, socialization, and assimilation as they come to the end of their education and training.</p> <p>Recommendation is to integrate both models to adjust for the differing needs between novice and experienced students.</p>
Theander K et al., 2016, Sweden	Aim: To examine the competence of nursing	Setting: A higher education nursing	Descriptive comparative design. The self-reported	IV: Implementation of a new nursing curriculum with more person-	No significant differences between the two groups. Both groups rated their	The 2014 graduated nursing students perceived their competences as high

Authors, Year, Country	Aim	Sample characteristics	Methodology, study design	Variables and Measures	Major Findings	Conclusions
	students after the implementation of a new Nursing curriculum. students who graduated in 2011 with the old curriculum were compared with students who graduated in 2014 with the new curriculum.	program at a Swedish university Sample: Total = 119 2011 n = 69 2014 n = 50 Sampling: The head of the nursing program distributed the questionnaire. The nursing students responded to the NPC scale directly before their graduation.	professional competencies were assessed with the NPC scale.	centered nursing. DV: Nursing students who graduated in 2011 and 2014.	competency as very high.	after the intervention of the new curriculum. Person-centered nursing is being recognized as effective and important.
Birks et al., 2017, Australia	The objective of this study was to explore nursing students' perceptions on block and distributed clinical placement	Setting: Four Australian universities Sample: N= 22 third year undergraduate nursing students	Descriptive, exploratory. 3 focus group interviews, 1 individual interview The interviews were recorded and transcribed for thematic	IV: Block and distributive models of placement DV: learning experience	Findings: 5 themes: "We're there to learn," "Taking all that knowledge out and practicing it," "You actually feel a part of the team," "Just prepare them for us coming," and "It's really individual."	More students preferred the block placements. Block placements fostered consistency in clinical placement compared to distributed placements.

Authors, Year, Country	Aim	Sample characteristics	Methodology, study design	Variables and Measures	Major Findings	Conclusions
	models, and which produced a more positive learning experience.	Sampling: convenience sample	analysis. A qualitative data analysis software (NVivo) was used.			

Abbreviations: CMSRU, Cooper Medical School of Rowan University. SPSS, Statistical Package for Social Sciences. DREEM, Dundee Ready Educational Environment Measure. BSCPE, Belongingness Scale-Clinical Placement Experience. MEAS, Mentorship Environment Assessment Scale. REDCap, Research Electronic Data Capture. NPC, Nurse Professional Competence.

Table 2. Total Programs Meeting Inclusion Criteria

Name of Program	
AdventHealth University	Rush University
Augusta University	Rutgers
Baptist Health Murray State University Program of Anesthesia	Samford University
Barry University	Southern Illinois University
Baylor College	Texas Christian University
Boston College	Thomas Jefferson University
Bryan College of Health Sciences	Truman Medical Center Hospital Hill
Case Western Reserve University	University of North Carolina Greensboro
Central Connecticut State University- Yale New Haven Hospital	Uniformed Services University of the Health Sciences
Charleston Area Medical Center School of Nurse Anesthesia	Union University
DePaul University - NorthShore University HealthSystem	University of Alabama at Birmingham
Duke University	University of Arizona
Emory University	University of Cincinnati
Fairfield University	University of Iowa
Florida International University	University of Kansas
Franciscan Missionaries of Our Lady University	University of Maryland
Georgetown University	University of Miami
Gonzaga University	University of Michigan - Flint
Kaiser Permanente - CSU Fullerton	University of Minnesota
Loma Linda University	University of North Florida
Louisiana State University	University of Pennsylvania
Marian University	University of Pittsburgh
Marquette University	University of Saint Francis
Mayo Clinic, Rochester	University of South Florida
Medical University of South Carolina	University of Southern Mississippi
Michigan State University	University of Tennessee, Knoxville
Middle Tennessee School of Anesthesia	University of Texas at Houston
Millikin University - Decatur Memorial Hospital	University of Wisconsin-Oshkosh College
Missouri State University	US Army Graduate Program in Nursing Anesthesia
Mount Marty University	University of Southern California
National University, Fresno	Virginia Commonwealth University
Northeastern University	Webster University
Northern Kentucky University	Western Carolina University
Oakland University Beaumont	Central Connecticut State University- Yale New Haven Hospital
Old Dominion University	York College of Pennsylvania
Oregon Health and Science University	
Otterbein University	
Quinnipiac University	
Rosalind Franklin University	

Table 3. Eligible, Nonparticipating Programs

Program	Nonparticipation Reason	Curriculum Model
National University, Fresno Loma Linda University Fairfield University Quinnipiac University Georgetown University University of Miami University of South Florida Emory University Augusta University Northern Kentucky University Northeastern University Boston College Michigan State University University of Minnesota Mayo Clinic, Rochester Rutgers School of Nursing Case Western Reserve University York College of Pennsylvania Mount Marty University University of Tennessee, Knoxville University of Texas at Houston US Army Graduate Program in Nurse Anesthesia Old Dominion University Charleston Area Medical Center School of Nurse Anesthesia University of North Florida	No response to any email correspondence	Nonintegrative
Kaiser Permanente-CSU Fullerton Barry University Florida International University Louisiana State University Missouri State University Oregon Health and Science University University of Wisconsin-Oshkosh College	No response to any email correspondence	Integrative
Marquette University Rush University	Current curriculum/leadership restructuring	Integrative Integrative
Otterbein University	Graduating class with MSN	Integrative
Thomas Jefferson University	Conflict of interest	Integrative
Cedar Crest College	New program without a graduating class	Nonintegrative

Table 4. Study Sample by Primary Critical Care Experience

Primary Critical Care Experience	Curriculum Type	
	Integrative ^a	Non-integrative ^b
Emergency Department	0	4 (5%)
Medical ICU	17 (28.3%)	21 (26.3%)
Surgical ICU	10 (16.7%)	8 (10%)
Trauma ICU	4 (6.7%)	3 (3.8%)
Neuro ICU	6 (10%)	5 (6.3%)
Cardiac/Cardiothoracic ICU	16 (26.7%)	26 (32.5%)
Neonatal/Pediatric ICU	4 (6.7%)	9 (11.3%)
Other	3 (5%)	4 (5%)

Abbreviations: ICU, intensive care unit.

^aIntegrative curriculum is the simultaneous occurrence of clinical experience and didactic work within the first year.

^bNon-integrative refers to a curriculum where didactic work occurs first and is followed by clinical experience after the completion of the first year.

Table 5. Study Sample by Years of Critical Care Experience

Number of Years Worked	Curriculum Type	
	Integrative ^a	Non-integrative ^b
2	18 (30%)	16 (20%)
3	13 (21.7%)	24 (30%)
> 3	29 (48.3%)	40 (50%)

^aIntegrative curriculum is the simultaneous occurrence of clinical experience and didactic work within the first year.

^bNon-integrative refers to a curriculum where didactic work occurs first and is followed by clinical experience after the completion of the first year.

Appendix A
DNP Team and Project Implementation Form



University of Pennsylvania
School of Nursing
Doctor of Nursing Practice Program

DNP Team and Project Implementation Form

This form is to be completed by the student(s), institutional/organization project member(s), and school of nursing project lead and submitted for approval to the DNP Program Director.

Student Name: Kevin Vacca, Diana Le Dang, and Emily Carrillo

Project Title: Effects of Curriculum Structure on Students' Self-Efficacy and Learning

School of Nursing DNP Project Faculty Lead: Dr. Dawn Bent

Institutional/Organization DNP Project Member(s): Not Applicable

I hereby accept the following proposed project pending IRB approval (completed by student[s]):

Project Site:

Proposed theoretical site is COA-accredited CRNA programs. Implementation will not occur at a specific site or geographical location. Project operations will occur at the University of Pennsylvania.

Project Purpose:

This project will add to the growing body of literature within the field of nursing education and focus on how best to implement education and training that will optimize the experiences of students in nurse anesthesia programs

Project Activities:

Survey dissemination via Google Forms, data collection, and data analysis with SPSS

Participants (Describe target group; approximate # in project):

Target group is senior SRNAs expected to graduate within 12 months. Surveys will be sent to the program directors of 88 eligible programs to be dispersed to senior students. We expect about 550 responses—the equivalent to a 25% response rate.

Site(s) Support (Resources):

Richard James – Liaison Librarian to the School of Nursing
John Barrett
Bruno Saconi

Data Management Plan:

All responses will be electronically stored initially via Google Forms, then imported and managed via the Research Electronic Data Capture (REDCap)--a secure web application for building and managing online surveys and databases. The data will be numeric, in the form of a 4-point Likert scale, and collected throughout the duration of one month. The data codebook will be generated using Microsoft Word. The data will not include personal health information and/or require human subject review; therefore, data security is not an issue that needs to be considered. Participants must login with Google to ensure that only one response per student is collected. Anonymity will be maintained.

Anticipated Start Date: August 2020

Anticipated End Date: December 2021


I hereby consent to serve on the DNP Project Committee.

We understand that this site's participation will only take place during the project's active IRB approval period. All project activities must cease if IRB approval expires or is suspended. We understand that any activities involving Personal Private Information of Protected Health Information may require compliance with HIPAA laws and the University of Pennsylvania's policy. Our organization agrees to the terms and conditions stated above. If we have any concerns related to this project, we will contact the project team. For concerns regarding IRB policy or human subject welfare, we may also contact the UPENN IRB.

As a doctoral student member of this team, I agree to conduct the project to the best of my abilities with professionalism.

Student Signature: 

Student Signature: 

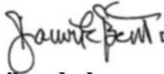
Student Signature: 

As an institutional/organization member of this project team, I agree to read and review all drafts of the project within a timely turnaround (approximately 2 weeks).

Team Member Signature: Not Applicable

Contact Information (email and phone number): Not Applicable

As the School of Nursing DNP Project faculty lead, I agree to meet with the student(s) and consult throughout the project.

Faculty Lead Signature:  DNP, MSN, CRNA

Contact information (email and phone number):

Dr. Dawn Bent

bentd@nursing.upenn.edu

Office 215-898-8292

Cell 215-327-5107

APPROVED BY DIRECTOR, DOCTOR OF NURSING PRACTICE PROGRAM:

Director Signature:  DNP, MSN, CRNA

Date Approved: 12.5.2020

Appendix B IRB Approval



Institutional Review Board

3600 Civic Center Blvd., 9th Floor

Philadelphia, PA 19104

Phone: 215-573-2540

(Federalwide Assurance # 00004028)

DATE: 03-Feb-2021
 TO: Dawn E Bent
 CC: Vacca, Kevin
 Dang, Diana
 Carrillo, Emily

RE:

IRB PROTOCOL#: 844901

PROTOCOL TITLE: Effects of Curriculum Structure on Students Self-Efficacy and Learning

SPONSOR: NO SPONSOR NUMBER

REVIEW BOARD: IRB #8

IRB SUBMISSION: NOTICE OF EXEMPTION

Dear Dr. Bent,

The above referenced protocol was reviewed by the Institutional Review Board on 02-Feb-2021. It has been determined that the proposal meets eligibility criteria for IRB review exemption authorized by 45 CFR 46.104, category 2.

ONGOING REVIEW:

- The IRB must be kept apprised of any and all changes in the research that may have an impact on the IRB review mechanism needed for a specific proposal. You are required to submit modifications to the IRB if any changes are proposed in the study that might alter the exemption determination, or any applicable HIPAA waiver determination. New procedures that may have an impact on the exemption determination, or HIPAA waiver determination cannot be initiated until Committee approval has been given.
- Consistent with the federal regulations, IRB approval of this protocol will not expire and no continuing reviews will be required for this protocol. The IRB may occasionally contact you to confirm that the trial is still ongoing and that you are adhering the previously stated requirement to submit modifications.

COMMITTEE APPROVALS: You are responsible for assuring and maintaining other relevant committee approvals. This human subjects research protocol should not commence until all relevant committee approvals have been obtained.

If your study is funded by an external agency, please retain this letter as documentation of the IRB's determination regarding your proposal.

If you have any questions about the information in this letter, please contact the IRB administrative staff. A full listing of staff members and contact information can be found on our website: <http://www.irb.upenn.edu>

***This letter constitutes official University of Pennsylvania IRB correspondence. ***

Appendix C Project Charter

AIM	
To add to the body of literature of nursing education on how best to implement education and training that will optimize the experiences of students in nurse anesthesia programs	
PROBLEM	
The current body of literature in nursing education does not provide a clarity on a single curriculum model that optimizes students' self-efficacy. This project will clarify whether integrative or non-integrative curriculum correlates to higher self-efficacy in SRNAs, following the completion of the program.	
IMPORTANCE	
The significance of this project can be found in the overarching goal set forth. To change the culture in nurse anesthesia education during the transition to a DNP will not only optimize the students' learning experiences and self-efficacy, but it aligns with the mission and goals of the AACN, CCNE, and AANA. Therefore, there is a high likelihood of support and buy-in. This may potentially lead to a future, prototypical curriculum design that nurse anesthesia programs can adopt and therefore, close the disparities that may exist among graduating SRNAs. The limited number of studies on this particular focus only emphasizes the importance and need for this project.	
EXPECTED OUTCOMES	
A minimum response rate of 25% from each program, this approximately means 550 senior student registered nurse anesthetists. Of the respondents, composite scores will be higher in those who are enrolled in an integrative curriculum compared to non-integrative curriculum.	
MEASURES	
Measurement outcome: self-efficacy indicated by composite score on the General Self-Efficacy Scale, 10-40	
RISKS/BARRIERS	
The major barriers stem from the online medium to which communication and surveys will be accessed. These barriers include communication made by the team that will go unread and possibly deleted due to email systems recognizing this as spam or if program directors are bombarded with a large volume of emails, all emails affiliated with the project will go unnoticed. Therefore, survey links will not be forwarded to prospective participants. Additionally, due to the short period of time the survey will be open, a low response rate may result.	
STAKEHOLDERS	
<ul style="list-style-type: none"> •American Association of Nurse Anesthetist (AANA) •American Association of College of Nursing (AACN) •Commission of Collegiate Nursing Education (CCNE) •Program Directors of respective nurse anesthesia programs •Student Registered Nurse Anesthetists (SRNAs) <p>As the project implementation phase begins, feedback from program directors and students are openly accepted as all communication will be done electronically. Ideas, revelations, questions, concerns, and survey experience will be considered and incorporated into the discussion of the project.</p>	
SCOPE	
In Scope:	Out of Scope:
•Nurse anesthesia program accredited by the Council of Accreditation	•Masters awarding nurse anesthesia programs\

<ul style="list-style-type: none"> • Doctor of Nursing Practice (DNP) granting program • Integrative curriculum: clinical experience within first year of study • Non-integrative curriculum: clinical experience after first year of study • SRNAs graduating with a DNP within 12 months of survey distribution. 	<ul style="list-style-type: none"> • Hybrid curriculum involving online or distance learning pre-COVID19. • SRNAs not graduating within 12 months with a DNP from date of survey distribution.
SCHEDULE	
<ul style="list-style-type: none"> • November 3, 2020: Meeting with UPenn nursing library liaison to decide on a measurement tool. • November 17, 2020: Introductory email sent to program directors of the 88 eligible programs to established rapport. • November 27, 2020: Submission of general self-efficacy scale for IRB approval/exemption. • December 8, 2020: Formal project proposal presentation to faculty. • December 21, 2020: Pending IRB approval/exemption, survey will be sent to students via link. • January 29-31, 2021: Cleansing of data (survey responses) and identification of response distribution and outliers. • February 1-8, 2021: Statistical test applied and analysis of data. Conclusion of results. • February 9-19, 2021: Formulation of discussion and reflection on project design, limitations, weaknesses, strengths, and future implications. 	
PROJECT TEAM	
Diana Le Dang, MSN, AGACNP-BC, RN	team member 1
Kevin Vacca, BSN, RN	team member 2
Emily Carrillo, BSN, RN	team member 3
Dawn Bent, DNP, MSN, CRNA	Faculty lead/DNP project advisor

Appendix D Gant Chart

