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## Innovations to Improve the DNP Practice Environment: An Evaluation of the DNP Project Process

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**Innovations to Improve the DNP Practice Environment:**

**An Evaluation of the DNP Project Process**

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### Abstract

**Purpose:** This project aims to identify the gaps in DNP education and project development, implementation, and dissemination. The DNP Project will also recommend new and innovative approaches that produce graduates with the capacity to provide quality care, offer creative solutions, provide practical and translational leadership, and shift the view of healthcare to create positive outcomes.

**Background:** The goal of the DNP project is to translate evidence into practice to improve healthcare outcomes through direct or indirect care for systems and populations (Murphy, 2018). To effectively assist students in executing a scholarly change project, in the face of the many obstacles within DNP programs, the DNP project process must adopt innovative technologies and seamless education and practice pathways to improve the structure, the process, and outcomes (VanderKooi, 2018). Use of the Lean Six Sigma Framework can be integrated as a quality improvement process to identify the gaps in the DNP project process. It aims to create flow and eliminate waste, improve process capability and remove variation (Hill, J., et al., 2018).

**Methods:** This was a quality improvement study design. Subjects were recruited via convenience sampling and included DNP (current and alumni) students enrolled in accredited DNP programs. Social media platforms and email communication were used as the setting. Participants were recruited from anywhere in the United States (US), implementing their projects at different facilities. The data collection instrument used to gather and disseminate findings was a 48-question mixed-method survey that combined demographic, multiple-choice, Likert scale, and open-ended questions. There was also a voluntary focus session that consisted of nine open-ended questions.

**Results:** Results concluded that stress derived from the overwhelming nature of the DNP capstone, differing expectations within the program, ineffective communication, and working in isolation were the most significant factors contributing to students' dissatisfaction.

**Significance:** We need to get a deeper understanding of the DNP project process from the perspective of all key stakeholders (student, faculty, clinical site/preceptor) to ensure a rigorous curriculum, producing sustainable projects aligned with the student's vision. DNP-prepared nurses will be the new leaders for healthcare, and our goal should be to create leaders that will improve the state of our healthcare and improve patient and provider outcomes.

**Key words:** DNP project, Lean Six Sigma, DNP curriculum, quality improvement, graduate nursing education.

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### **Background and Significance**

Over the past decade, the exponential growth of enrolled students in DNP programs has brought significant benefits and challenges to this new practice doctorate. It has also caused varying approaches regarding curricular preparation, DNP project development and implementation, practice rotations, and partnerships (Grossman, 2016). As a result of increasing demands for more doctoral-prepared nurses, inconsistencies in DNP program pathways, lack of resources, shortage of faculty, and capacity issues result in many graduates not being equipped with the core competencies and organizational leadership skills required for advanced practice (Frantz, 2013).

The many aspects of the development of a DNP program are driven by the Essentials for Doctoral Education for Advanced Nursing Practice guidelines and recommendations from the American Association of Colleges of Nursing (AACN) Task Force to prepare DNP students to practice at the highest level of nursing practice, translate evidence into practice to improve outcomes and lead healthcare systems at the organizational level (Murphy, 2018). The scholarly Doctor of Nursing Practice (DNP) project requirements requires substantial faculty mentorship, clinician preceptors, clinical practice partnership and support, and other DNP project resources. Unfortunately, the formidable barriers like faculty shortages, enrollment capacity issues, lack of academic-practice partnerships, questionable curriculum rigor, and use of legacy technology systems and teaching styles make it difficult to maintain quality programs and also meet the needs of policy initiatives aimed at expanding and improving upon the clinical nursing doctorate pathway (Minnick, 2013). In addition to the DNP programs emphasizing increased scholarly knowledge and leadership, they also require practice proficiency from immersion experiences

acquired through partnerships with clinical agencies where implementation of the change project occurs (Grossman, 2016).

This integrative learning pathway is intentionally sequenced to prepare students for DNP project completion. The goal of the DNP project is to translate evidence into practice to improve healthcare outcomes through direct or indirect care for systems and populations (Murphy, 2018). To effectively assist students in executing a scholarly change project, in the face of the many obstacles within DNP programs, the DNP project process must adopt innovative technologies and seamless education and practice pathways to improve the structure, process, and outcomes (VanderKooi, 2018). Therefore, the purpose of this article is to: 1) identify barriers that impede DNP project completion, 2) investigate the project process of a group of DNP students from various academic institutions implementing their project at different sites, 3) use the Lean Six Sigma Framework to decrease waste and maximize process improvements (Clark, 2013), 4) analyze summative data following evaluation of this process, 5) discuss lessons learned and recommendations, and 6) provide action steps to implement appropriate innovation technologies.

### **Problem Statement**

The overall DNP project process, from ideation to dissemination, has been identified by the current and prior DNP students, current clinical nurse scientists, and nursing faculty as a significant challenge to project completion. The different facets of the process are siloed, making it difficult to track the student progression and implying that it is essential to implement an innovative seamless solution to produce better outcomes (Costello, 2014).

### **PICOT Question**

This Doctor of Nursing Practice scholarly project will evaluate the DNP project process of DNP programs across the United States. The clinical question will assess the current DNP project process, simultaneously occurring at the academic institution and the practice setting. Recommendations will address innovations that can improve and streamline the efficiency, effectiveness, sustainability, rigor, and student support among current DNP students and recent alumni nationwide.

Currently, there are over 30,000 postgraduate nursing students, either DNP (post-MSN or BSN-DNP) in the United States (US) ("AACN Website," 2004) that currently use a hospital, clinic, or community health organization site for their DNP project. Within the practice facilities, the students are managed and supervised by either nurse scientists, nurse clinicians, or nurse executives who help advise their project from development to dissemination. The PICO question will be, in DNP programs across the United States, what innovations can improve and streamline the DNP project process and educational environment?

### **Review of Literature**

#### **Search Strategy**

A literature review was conducted using the keywords: Doctor of Nursing Practice, DNP project, diffusion of innovation, and doctoral supervision. The search formula utilized was (Doctor of Nursing Practice or DNP or postgraduate nurse) AND (project supervision or research supervision or clinical education) OR (workflow management system or WMS or learning management system or LMS or student portal). The author initiated the literature search with PubMed and CINAHL databases. The investigation was followed by Google Scholar and the American Association of Colleges of Nursing (AACN) website. Search parameters include limitations to articles in English, years 2003 to present, and published in academic journals. For

this initial search, abstracts were reviewed, and articles that did not address the current practices of graduate nursing or DNP education, lean six sigma methodology, or how the nursing curriculum could be improved were eliminated. See Appendix A for an outline of the search strategy.

### **Search Results**

In PubMed, the initial search with keywords outlined above produced 20,550 articles. Once these were limited to English language articles since 2003 in academic journals that provided free full text, 6,044 articles were identified. Initial search from CINAHL with keywords outlined above identified 256 articles. Once these were limited to English language articles since 2003 in academic journals, the yield was reduced to 247 articles. In Google Scholar, the initial search with keywords outlined above produced 6,450 articles. Once these were limited to articles since 2003 in academic journals, excluding patents, 6,050 articles were identified. These lists were compiled, duplicates removed, abstracts reviewed for additional parameters outlined above, and 11 articles were identified for further review and appraisal. Searches on the AACN website did not reveal any relevant results. See figure 1 for an outline of the results.

A review of articles was based on the nursing research pyramid, or nursing research hierarchy of evidence, which assisted in determining the level of evidence, and critiquing the study to ensure it is reliable and valid (Ingham-Broomfield, 2016). The levels of evidence are organized in a visual and systematic illustration, with the least reliable at the base of the pyramid and the most reliable evidence located at the apex of the pyramid. Evidence-based practice (EBP) is the pillar of robust research. It consists of a hierarchy of seven levels of evidence: editorials (VII), case studies (VI), cohort studies (V), randomized control trials (RCT) (IV), critically appraised individual articles (III), critically appraised topics (II), and systematic

reviews/meta-analyses (I) (Ingham-Broomfield, 2016). The articles in this review included meta-analysis, critically appraised topic, cohort study, critically appraised individual article, and randomized control trial.

### **Synthesis of Evidence**

The literature evaluated DNP students, DNP curriculum, DNP project process, and information systems implementation. It addressed two key areas: characteristics of the implementation of innovation, factors, and challenges affecting students and supervisors regarding postgraduate supervision, and the DNP project. This synthesis will look at some of the studies in both areas and how these apply to the current project and clinical practice.

A study by Allen and colleagues (2017) was a systematic review of 76 studies from 1973-to 2013, looking at outcome data related to the implementation of innovation by assessing the constructs as defined by the Consolidated Framework for Implementation Research (CFIR) (Allen, 2017). Overall, there were 14 constructs identified, and Diffusion of Innovation was the most cited theory. The primary constructs of potential importance to adoption and implementation could be categorized as climate, culture, participation, communication, power, and leadership (Allen, 2017). While the systematic review considered a variety of settings, multiple disciplines, and innovation types, evidence suggested that there is a lack of standardization to assess organizational characteristics (Allen, 2017). Dissemination and implementation (D&I) within an organization were measured, but there were inconsistent definitions of constructs and a lack of information for organizational measures. However, findings support that implementation cannot occur without adoption (Allen, 2017).

Another study investigated the current situation of existing quality monitoring systems and functions that helped improve the quality of education (Huang, 2016). The study, a nonexperimental, descriptive process, evaluation, and project implementation design, found that a quality monitoring system can guarantee improvement of education quality. The system's primary function employs team collaboration compared to the single tutor mode (Huang, 2016). Characteristics of a good design include supervising, regulating, controlling, guiding, and inspiring postgraduate nursing students while also providing a feedback mechanism for bidirectional feedback (Huang, 2016).

A study by Yao titled "A framework for web-based research support systems" explored web-based research support systems (WRSS), a subset of a decision support system (DSS), to support various research activities (Yao, 2003). The main discussion of this study focused on the characteristics and functionalities of RSS. DSS is based on computer science and management science (Yao, 2003). A well-developed management system can support all aspects of research and integrate with existing computer systems, significantly creating robust analysis.

Findings from these studies show a wide variety of characteristics and functionalities of management systems that may or may not be helpful for a healthcare organization or academic institution with research and project supervision for the postgraduate nursing student. Many studies recommend that organizations need to find congruency and standardize implementing technology (Allen, 2017; Huang, 2016; Yao, 2003).

Information and communication tools (ICT) redesign traditional teaching methods. This first study investigated the responses of 242 students and 46 teachers after administering questionnaires regarding five domains of ICT tools: feedback, collaboration, publishing, classroom mobility, and social media (Wu, Pan, & Yuan, 2017). Findings support the use of ICT

tools to enhance the educational experience. Both the students and teachers find the usage of ICT tools favorable for collaborative and productive work and facilitate improvement of education quality (Wu et al., 2017).

A descriptive research study written by Dols and his colleagues (2017) describes the challenges related to the DNP project across the United States (Dols, 2017). In the survey, 90 DNP program directors were given an online survey to address their dissatisfaction with the DNP environment and scholarly project. About 87% responded as somewhat dissatisfied with the DNP project (Dols, 2017). Some elements included: scholarly writing skills, lack of clinical sites, lack of faculty, little to no knowledge of evidence-based practice, and lack of consensus on the topic for the DNP project (Dols, 2017). Nursing programs need to implement revised processes to increase practice and academic faculty satisfaction.

A final study by Caldwell and colleagues (2012) identifies supervision issues in the clinical setting as ranked by postgraduate nursing students (Caldwell, 2012). The study used the Delphi method to explore issues and facilitate consensus and small groups. Students identified those clinician supervisors had difficulty prioritizing and scheduling student meetings. They also had low awareness of their limitations regarding training, supervisory skills, and student access to resources (Caldwell, 2012).

Many issues discussed in these articles are generic to all postgraduate nursing students in the clinical setting regarding project supervision. Based on the challenges that both students and supervisors experience, it would be beneficial for academic and clinical faculty to receive formal training in project supervision, and the DNP environment requires resources that foster the student-supervisor relationship (Caldwell, 2012; Dols et al., 2017; Wu et al., 2017)

## Conceptual and Theoretical Framework

### Lean Six Sigma

The Lean Six Sigma (LSS) Framework can be integrated as a quality improvement process to identify the gaps in the DNP project process. It aims to create flow, eliminate waste, improve process capability, and remove variation (Hill et al., 2018). Studies show that lean six Sigma can be used in higher education to enhance curriculum development and delivery, student and faculty performances, program design, cultural changes, quality improvement, and communication methods (Al Kuwaiti, 2020).

The LSS concept focuses on the two distinct concepts, Lean and Six Sigma. Lean is a methodology used to improve process flow by identifying value vs. non-value steps and reducing waste (Sony et al., 2020). Six Sigma (define-measure-analyze-improve-control, or DMAIC) seeks value by identifying defects and failure, reducing variation in the process, and improving customer dissatisfaction (Antony, 2014; Sony et al., 2020). Lean Six Sigma enhances quality excellence through continuous process improvement measures (Mahalingam, 2018). In higher education, more specifically, nursing graduate education, LSS is still emerging and is in the infancy stage as it is a new quality practice in the nursing education sector (Mahalingam, 2018). A barrier to implementing Lean Six Sigma in nursing culture is that Lean methodology is not data-driven and does not have evidence of any measurement system in the literature (Mahalingam, 2018). However, the integrated approach of LSS effectively solve complex problems focused on the customers, in this case, the student's needs, and assures a standard quality of excellence (Al Kuwaiti, 2020).

The tools and techniques used in the LSS process for higher education institutions include process mapping/value stream mapping, cause, and effect analysis, visual management, Pareto analysis, project charter, supplier-input-process-output-customer (SIPOC), and rapid improvement or Kaizen events (Antony et al., 2012).

*Process mapping/value stream mapping*

Allows the organization to agree on what the customer views as value and where the waste (non-value steps) is in the process (Antony et al., 2012).

*Cause and Effect Analysis*

It allows the team to brainstorm and identify the root causes of the problem (Antony et al., 2012).

*Visual Management*

Allows the team to indicate work priorities, define work standards, show workflow, designate tasks, and communicate what performance measures are in place (Antony et al., 2012).

*Pareto Analysis*

Identifies vital causes for the problem and allows the team to know where to direct their improvement efforts (Antony et al., 2012).

*Project Charter*

Known as the "define phase" of LSS methodology, this is an overview of the project and is an agreement between the two parties on the expected project outcomes (Antony et al., 2012).

*Supplier-input-process-output-customer (SIPOC)*

SIPOC is a high-level process that identifies outputs and customers of those outputs, process boundaries, critical activities, critical inputs to the processes, and critical-to-quality requirements for the inputs, processes, and outputs (Antony et al., 2012).

### *Rapid Improvement/Kaizen Events*

Three-to-five-day workshop focused on departmental processes centered around engaging team members in the change process and influencing rapid decision making to tackle a problem and create potential solutions (Antony et al., 2012). This strategic approach varies based on the organization's needs and can profoundly impact the continuous improvement culture of the DNP curriculum and the DNP project process.

### **Project Design**

Quality improvement elements (measuring, monitoring, sustainability) are essential to transformational nursing education and healthcare (Durham, 2019). This DNP project focused on identifying challenges and opportunities for improvement in the DNP project process and DNP curriculum. Quality improvement must include a "systems thinking" approach, which must look at all the components within a system and see how they are interconnected and interdependent (McNab, 2020). This project aimed to provide recommendations that can synthesize patterns, interactions, and standardize activities amongst different types of DNP programs and streamline the DNP project process.

### **Methodology**

A mixed-methods design was used for this quality improvement project to assess the perspectives of limitations and advantages of their experience of their DNP program and their view of their DNP project process using surveys and focus groups. Convenience and snowball sampling methods were used to recruit participants with flyers, social media pages, email, and word of mouth. The aims behind the population of choice, sample size, setting, and resources are discussed in detail.

### **Population**

There is approximately 350 Doctor of Nursing Practice (DNP) programs in the United States, with about 30,000 students, are currently enrolled in DNP programs and nearly 7,000 DNP graduates ("AACN Website," 2004). Presently, only 79.8% of APRNs hold a master's as their highest degree, and just 14% have a DNP, as reported by the American Association of Nurse Practitioners (AANP, 2019; McCauley, L. A., et al., 2020). DNP-educated advanced practice registered nurses (APRNs) have a wide range of diverse backgrounds and experiences. The nursing students enrolling in DNP programs include master-prepared clinicians, administrators who have enrolled in the post-MSN-to-DNP program seeking executive leadership or education expertise, and nurses with Bachelor of Science in Nursing (BSN) enrolling in BSN-to-DNP programs to become system leaders or APRNs. Also, second-degree graduates enroll into the entry to practice programs to obtain their DNP to practice as an APRN (McCauley et al., 2020).

The initiation of the DNP programs began when the Institute of Medicine's landmark reports identified significant medical errors affecting patient care, quality, and safety (Institute of Medicine, 2011; McCauley et al., 2020). They offered strong recommendations that included doctorate-prepared nurses' expert clinical leadership (McCauley et al., 2020). In 2004, the AACN supported this recommendation by releasing a *Position Statement on the Practice Doctorate* (AACN, 2004; McCauley et al., 2020), and in 2006 they further endorsed this initiative by publishing their recommendations in *The Essentials of Doctoral Education for Advanced Nursing Practice* and the *DNP Roadmap Task Force Report* (AACN, 2006; McCauley et al., 2020)

Target participants are DNP students and recent or alumni DNP graduates who graduated no more than 12 months prior. Inclusion criteria for participation in this study will be associated

with nationally accredited DNP programs in the United States that The Commission accredits on Collegiate Nursing Education (CCNE) and the Accreditation Commission for Education in Nursing (ACEN). These programs can be exclusively online, hybrid, or brick and mortar. Participants will be excluded if they are not associated with a nationally accredited DNP program or an alumnus; they graduated more than 12 months from when the survey was distributed.

### **Sample Size**

There was not much literature exploring the culture of the DNP curriculum and project process. However, qualitative studies addressed different aspects of the DNP culture that contributed to this DNP project's rigor, reliability, and validity. Not many of the studies included students as the targeted population, as many were either qualitative descriptive or qualitative exploratory studies. For significant results, a robust sample size is imperative to understand better the student's perspective of motivational factors and barriers of the DNP project.

Due to the social distancing restrictions enforced by Georgia State University's Institutional Review Board (IRB) secondary to COVID-19, the sample size of 50 was appropriate and able to obtain. The target sample size was reduced to 50 current or alumnus DNP students from accredited DNP programs across the United States of America implementing their projects at different facilities and meeting inclusion criteria.

### **Settings**

Social media platforms like Facebook™ and LinkedIn™ are popular for discussing content, exchanging ideas, and simply a mode of communicating with family, friends, and strangers (Arigo et al., 2018). As their popularity increases, so does their utility for recruitment purposes for clinical studies, health research, and clinical projects. Social media platforms have the potential to reach a widespread and diverse population. It is cost-effective, accessible to all

users, and has various options for marketing (Arigo et al., 2018). This DNP project leveraged social media platforms and electronic forms of communication like email to engage recruitment participants. Maintaining ethical guidelines provided by GSU IRB, participants in Facebook™ groups targeting APRNs who were current students or alumni of accredited DNP programs were recruited via an IRB-approved posting or email to participate in the study voluntarily.

### **Implementation/Evaluation**

Recruitment started after IRB approval was obtained from Georgia State University during the first week of August 2020. Recruitment was carried out throughout the following three months and completed on December 6, 2020. As participants were recruited, they completed the survey. A total of 51 participants enrolled, 48 completed the survey, and 8 of the 48 participants also participated in the focus group sessions within the three months.

### **Instrument/Tools**

The data collection instrument used to gather and disseminate findings was a 48-question mixed-method survey that combined demographic, multiple-choice, Likert scale, and open-ended questions. The survey was designed to measure the perception and sentiments about their view of the DNP project process. The multiple-choice and Likert scale questions specifically explored the attitudes towards learning, stressors, facilitators, and perspectives about their DNP program. Due to limited qualitative studies using questionnaires to yield data investigating DNP education, the questions were created using design thinking. Design thinking (DT) is an iterative approach to problem-solving that relies on empathetic, action-oriented, open-minded, and non-judgmental techniques grounded firmly in the end user's needs (Gottlieb et al., 2017). The steps for this process include discovery, interpretation, ideation, experimentation, and

evolution (Gottlieb et al., 2017). This approach allows for an extensive list of potential solutions, continual iterations, and further understanding of user needs (Mclaughlin et al., 2019).

The focus group questions were granted approval and adapted from two articles that addressed barriers and facilitators to nursing doctoral education (Kim et al., 2010; Staffileno et al., 2019). All authors were contacted and approved the use of their questions for the current project. The first study, written by Dr. Mija Kim et al., explored the concern about the quality of nursing doctoral education, specifically in Korea. The quality of faculty, student, curriculum, and resources were assessed by four focus groups that examined the strengths and weaknesses of these four major components of nursing doctoral education (Kim et al., 2010). The second study by Dr. Beth Staffileno et al. was a qualitative study that explored the experiences of a DNP project facilitator. Focus groups were developed and conducted to address six themes, including (a) exploring student interest, (b) establishing a collaborative fit, (c) connecting with key stakeholders, (d) overcoming barriers, (e) role clarity, and (f) interaction (Staffileno et al., 2019).

The nine open-ended questions also used human-centered thinking and the lean methodology approach to identify the type of customer and learn about any new problems in the DNP project process. The focus group questions (*Appendix E*) addressed four components, including (a) strengths versus weaknesses of the DNP program, (b) pros versus cons of the DNP experience, (c) participants' view of hindering versus supportive measures of progression in the program, and (d) thoughts on standardizing DNP programs. The nine open-ended questions used design thinking and the lean methodology approach to identify the characteristics of the participants and learn about any new problems in the DNP project process.

### **Data Collection**

To recruit each type of participant, social networks, email solicitations, direct approach, and snowball sampling methods were used (Joseph, Keller, et al., 2016). They were asked if they wanted to participate in the series of questionnaires targeting different phases of the DNP project process. An Institutional Review Board (IRB) approved email with recruitment scripts was distributed electronically to inform participants about the survey and interview. The flyer and script described the project and included the student investigator's contact information. If the participant agreed to participate, they electronically received a consent form to read and sign.

DNP students who agreed to participate signed an electronic informed consent via Docusign™ that included important, informed consent information. Since the participants at least had a college degree to be included, the survey was written at a 10<sup>th</sup>-grade reading level. After completion of the 48-item electronic survey via Qualtrics™, which included inclusion criteria, demographics, Likert scale, and evaluation of program infrastructure questions, they were asked if they wanted to participate in a focus group (nine open-ended questions) that was delivered via web conferencing technology (Zoom™) that lasted approximately 60 minutes. There were multiple time slots available to accommodate busy schedules.

For focus groups, participants were either sent a mobile text message or a phone call one day before their chosen date and reminded of the scheduled meeting. At the focus group time, Zoom™ was used to administer discussion questions. The focus group was concluded by thanking each participant. The total time participants were involved in the study was no more than 3 hours. The survey and focus groups were administered in English.

The participants' information, survey responses, and discussion responses were obtained through video recordings, audio recordings, qualitative interviews, and Qualtrics™. Identifying information was de-identified, and alias names were used in this publication and any

presentations. Online activities can carry a risk of a data breach, but processes that minimized breach opportunities were used systems. This data was securely stored on a password-and-firewall-protected laptop in a restricted-access folder on an encrypted, cloud-based storage system. This data was kept until the study was completed, and then it was destroyed.

### **Data Analysis**

The overarching method used was a qualitative content analysis of the data (Sandelowski, 2000). Quantitative data were analyzed using descriptive statistics to address "what has happened," "what could happen," and "what should we do" (Raghupathi, 2013). Predictive analytics explored the barriers and challenges of the DNP project process and determined wasted or unnecessary steps in the process guided by LSS. The forecast method was the final step to construct recommendations that helped introduce innovative strategies to address the gaps in the process (Schwegmann, 2013).

## **Results**

### **Demographics**

At the start of the 16-week DNP project timeframe, a total of 55 participants were initially recruited, and seven did not meet inclusion criteria and were excluded from the survey. The remaining 48 participants (N=48) met the inclusion criteria and were given access to the 48-item survey. Additionally, eight participants completed the voluntary focus group session. The results consist of data from participants that completed the entire intervention.

The largest age group of participants of the DNP project represented was 46-55-year-olds, followed by 36-45 years, 26-35 years, 56-65 years, and 65 years and older. 54.9% of participants were alumni, while the remaining 45.1% were current DNP students. Thirty-eight participants identified as females, representing 95% of the participants, while only two identified

as males, made up the remaining 5% of the DNP project participants. Many of the participants, 47.5%, were enrolled in a primarily online DNP program, followed by 45% enrolled in a hybrid program (on-campus and online requirements), and 7.5% registered in traditional in-person DNP programs. All participants met inclusion criteria and progressed in the survey. Current DNP students had to be in at least the second semester of their program, and DNP alumni had to have graduated within the previous twelve months of taking the survey.

Participants were asked to provide information about their nursing background, which was evenly distributed among various specialties, including medical-surgical, intensive care unit, inpatient/acute care, emergency department, psychiatry, women's health, primary care, pediatrics, and public health, and sub-specialty clinics.

### **Attitudes Towards Learning and the DNP Program**

The following section asked the participants about their attitudes toward learning and their perspective on their nursing doctoral program, including their coursework, specifically the DNP project phase. When asked how much they liked their Doctor of Nursing Practice program, 80% responded that they were either slightly, moderately, or extremely satisfied on a six-point Likert scale. Participants were then asked about their perspective of risk factors that could have reduced or worsened stress. Seventy-five percent of respondents strongly agreed that having a flexible program is crucial for reducing stress. However, 80% of participants acknowledged that differing expectations between program faculty, preceptors and their expectations caused stress, 52.5% responded that working in isolation during the nursing doctoral coursework or in the capstone or change project has caused stress, and 60% of participants overall agreed that the overwhelming nature of the capstone or clinical change project phase had caused significant stress.

Even though most participants endorsed significant levels of stress with differing expectations of their DNP program, working in isolation, and the overwhelming nature and amount of workload of their DNP project, 56.5% of respondents felt their institution had a well-developed system to foster quality evidenced-based projects, 77.5% overall agreed faculty members demonstrated fulfillment of diverse faculty responsibilities and roles, including teaching, research, service, and mentoring, 72.5% overall agreed that faculty members devoted significant time to students' clinical change project from development to dissemination, and 80% recognized that the DNP project infrastructure was appropriate in facilitating evidence-based quality improvement and education. Furthermore, 72.5% agreed that there were enough faculty members to facilitate learning, 67.5% endorsed that the program had a process in place that fostered socialization of students and promoted interaction among students and between faculty and students, and 82.5% felt that there were sufficient materials and information available for students. Conversely, 55% overall disagreed about whether the school had various funding sources for students' DNP projects.

### **Use of Digital Technologies in the DNP Program**

The last section of the survey addressed the types of digital technologies used in the DNP program and preferences for using different digital technology in learning. In the initial questions, most respondents reported using a laptop or desktop, 39.36%, and smart phone, 36.17%, as digital devices frequently used. The following questions inquired about digital technologies in various learning and communication activities DNP programs require. Participants were required to answer questions using a Likert scale rating from "Never" to "Always," and significance was defined as receiving 50% or more of the total responses. When asked about the use of electronic devices (mobile smart phone or tablet/iPad) and laptops or

desktops for learning and communicative activities, participants responded "Always" that their mobile smart phones or tablets/iPad were used for emails (57.89%), direct or text messaging (55.26%), and accessing social media platforms (57.89%). Laptops or desktop computers were "Always" used for creating spreadsheets or charts (73.68%), creating presentations (84.21%), access to the learning management system (63.16%), creating electronic portfolios (50%), using video/audio web conferencing software (55.26%), accessing the university's library (65.79%), and writing for DNP project or coursework (86.84%).

### **Focus Group Questions**

After the survey was completed, participants were asked to participate in a voluntary nine-question focus session. Eight participants agreed and signed up for a one-hour session at their availability. Six of the participants identified their program as exclusively online, while the remaining two participants attended DNP programs with a hybrid structure. None of the participants specified being in an exclusively traditional in-person DNP program. The responses that emerged had common themes, including (a) ineffective communication and engagement, (b) lack of mentorship, (c) perspectives of the DNP Project process, (d) clinical hours, (d) technology improvements, and (d) cons of obtaining the DNP degree. The following section will review the themes and associated responses.

#### *Ineffective Communication and Engagement*

Many participants reported poor communication efforts within their program, feeling disconnected with a lack of engagement from faculty. As illustrated by one student, "I feel very disconnected with most faculty. There is minimal direction from the DNP advisor, and communication could be better." Another student commented, "I felt faculty were "paper

graders." There was no feedback from faculty, no responsive communication, and it took up to five days before receiving a response."

#### *Lack of Mentorship*

Many reported that lack of guidance and the need for a mentor negatively impacted their experience in the DNP program. One person said, "We did not have enough support initially, and we needed more guidance from an advisor or mentor." Another person responded, "I think we must have a mentor that knows the DNP project process. I spoke with other DNP students, and they spoke about having mentors and how it helped them through the process."

#### *Perspectives of the DNP Project Process*

Much of the discussion was about their experience with the DNP project process. While responses varied, a consensus of frustration emerged as they walked me through their experience with developing, implementing, and disseminating their DNP project. One participant stated, "They need to refine what it means to be productive and have more progressive thinking within the programs. Modify the requirements for DNP practicum hours. Have classes that can be done independently and be self-paced." Another person questioned the rigor and reputation of the programs. They commented, "How much of the curriculum at the MSN level is duplicated at the DNP level? I do not want to feel like they are just pushing students to graduate to get the DNP numbers up. I feel online programs may be diluting the nursing field. Are these programs even robust?"

One participant stated they had to extend their time in the program since their project did not meet DNP project guidelines. They responded, "Our projects had to be clinical-based, and not having enough participants or data to progress through the program on the project resulted in me failing to meet the project deadlines." A few participants complained that they wish

education-based projects could've been permissible. They ended up doing a clinical-based project that they were not passionate about. One person said, "They need to have education as a type of project in all DNP programs. My current project is not currently my passion because I had to go back into the clinical environment to do a project." Overall, a common theme reported was a lack of structure and guidance. A participant conveyed this by commenting, "We need more involvement from the program in the guidance of our DNP project such as more direction, how to implement, what creates the best outcomes, and what is the best information to create the most publishable information." One termed the DNP project process as "disorganized hell" stating that the "process was chaotic, and it felt like we were writing papers all the time that were not tied to our project. One must have resilience in these programs."

#### *Clinical Hours*

Under recommendations from the American Association of Colleges of Nursing (AACN), DNP graduates must complete 1,000 postbaccalaureate clinical hours (Wolf, 2011). According to *The Essentials of Doctoral Education for Advanced Nursing Practice*, clinical practice hours are defined as "any form of nursing intervention that influences health care outcomes for individuals or populations, including the direct care of individual patients, management of care for individuals and populations, administration of nursing and health care organizations, and the development and implementation of health policy" (AACN, 2006, p. 4). During the focus sessions, some participants felt that clinical hours could be modified to be more appropriate for those seeking a DNP. One person stated, "Clinical practice hours need to be re-evaluated, and they must recognize the diversity of students. The hours are overwhelming". Another person responded, "In my opinion, they need to change the required clinical hours and include more administrative/finance role hours and decrease project hours."

### *Technology Improvements*

Regarding technologies used in the program, the consensus was positive. While most felt there did not need to be any significant changes, one participant said, "These programs need to update current resources because they still have old legacy technology software in place, and it overwhelms the clarity of the program." Another person responded, "Our program has great access to technology platforms; however, Webex™ is the worst platform for web conferencing. Typhon™ is annoying because the setup seems redundant, it is not the most user-friendly, and not optimized for mobile devices. As a nurse educator, using Typhon™ to grade students' work requires you to click on everything individually, and it does not seem up to standard."

### **Discussion**

This project had four specific aims: to identify barriers that impede DNP project completion, investigate the scholarly project process of a group of DNP students from various academic institutions implementing their project at different sites, make recommendations using the Lean Six Sigma Framework to decrease waste and maximize process improvements, and provide action steps to implement appropriate innovation technologies.

The problems identified by the participants in this study had common underlying themes around being stressed, feeling frustrated and isolated, lack of communication, chaos within their program, and they felt some misalignment between the role of the DNP versus the DNP curriculum and DNP project process. This study provides new insights into DNP students' problems on their journey to earn their doctoral degree and becoming doctoral-prepared advanced practice nurses. The remainder of the discussion will explore recommendations to help improve the DNP project process and the structure of DNP programs.

The future of nursing relies on nurses with DNP degrees to effectively translate evidence into clinical practice. The knowledge and skillset originate with their ability to develop, implement, and disseminate a DNP project. The ongoing debate about what constitutes a robust and quality DNP project causes discrepancies in the DNP curriculum and DNP project process. Building strong academic-practice partnerships allows the organization to provide the DNP program with a list of topics and projects that align with its strategic vision and goals (Vessey, 2021). Developing DNP projects that are in "high demand" leads to increased sustainability of DNP projects. This affiliation can also lead to higher professionalism and mutual respect between the community and the DNP program. This affiliation will improve the dynamic, enhance collaboration, and contribute to the advancement of nursing (Vessey, 2021).

The project phase of any DNP program requires a high level of expertise on the topic of choice. DNP students must develop a thorough understanding of their DNP project with expectations to defend their DNP project and submit a manuscript to a nursing journal. Many participants felt that having access to a subject matter expert would have been beneficial to their success in the DNP program. A subject matter expert has a deep understanding and can provide valuable information to the student's DNP project. Their deep knowledge includes tribal expertise or knowledge that is undocumented and passed down verbally or in practice (iSixSigma, 2021). Collaborating with a subject matter expert can save time, effort, and frustration while enhancing quality improvement efforts.

Lack of knowledge around the DNP project process leads to disengagement and unfocused students, which can impede the student from timely completion. Studies show that either faculty or third-party mentoring demonstrated positive results during the DNP project's development, implementation, evaluation, and dissemination (Prol, 2020). The simple notion of

being available and accessible facilitates that student-mentor relationship by enhancing the socialization of the advanced practice role and supporting the execution of the DNP project (Prol, 2020).

The lack of standardization of the DNP project process was a significant challenge among participants. Reports of the DNP project process varied in format and quality. This variation calls for standardization across DNP programs to improve the sustainability and rigor of the DNP project (Sun, 2019). With very little literature on standardizing the DNP project process, one must recommend reliance on the logic model. The logic model is a road map that provides resources, activities, outputs, projected outcomes, and the impact of a quality improvement (QI) project. It has been successful in other sectors to aid program planning and implementation and performance management (Sun, 2019). Since the QI process model guides the DNP project, the logic model is recommended for use in the DNP project process (Idzik, 2021). For greater utilization, the logic model should be digitalized and be accessed through an electronic platform that is nationally accredited. This digital platform will allow all DNP students to access the same information to guide them through the DNP project process: identification, development, implementation, evaluation, and dissemination. Therefore, creating a standardized process that DNP programs can adopt and use in their curriculum.

Another challenge was that some participants were passionate about developing an education-based project. However, DNP programs, the newest doctoral degrees, yield clinical practice-focused professional degrees to translate evidence-based research to improve bedside care, patient outcomes, healthcare policies, and healthcare systems (Moss, 2022; Robb, 2005). It was intended for those interested in leadership or clinical nurse scientist roles. Two other

degrees, Doctor of Philosophy (Ph.D.) and Doctor of Education (EdD) are also options for nurses seeking a doctoral degree.

This uptick in doctorate-prepared nurses comes after the Institute of Medicine (IOM) recommendation published in the Future of Nursing report declaring that doctorate-prepared nurses need to double by 2020 (Moss, 2022; Robb, 2005). However, there's confusion on which degree is aligned with their career goals, and since DNP and Ph.D. degrees are most encouraged in the nursing community, many nurses enroll in these programs when it does not fit with their career goals. More education to delineate DNP, Ph.D., and EdD degrees needs to be included in the Master of Science in Nursing program curriculum. More education will further decrease confusion and alleviate any frustration, wasted time, money, and effort. Also, teaching the difference between doctoral degree programs can allow the nursing professional to contribute meaningfully to the profession to fuel their passions and satisfy their professional goals (Moss, 2022; Robb, 2005).

Transitioning into a doctorate-prepared nurse can be daunting for many without the appropriate guidance. Postdoctoral fellowships were initially created for those with Ph.D. degrees to help them gain direct experience with ongoing research with the support of a grant to fund their research efforts. Postdoctoral fellowships are a new concept for the DNP-prepared nurse and were created to help gain direct experience with evidence-based quality improvement projects. However, being a new concept for DNP-prepared nurses, not many reputable fellowships have prepared the nurse for their diverse future positions' various roles and responsibilities. With limited studies about the development of postdoctoral fellowships for DNP-prepared nurses, there should be substantial effort to create these fellowships to support transition after graduation.

These recommendations can create an environment where innovation and creativity are encouraged. Significant change is warranted to create an intense focus on scholarship, quality, and rigor of the DNP project process and DNP curriculum.

### **Project Limitations**

A major limitation of this study was the barrier that impeded the project, such as restrictions secondary to the Coronavirus (COVID-19) pandemic. This restricted face-to-face interaction was secondary to social distancing guidelines which limited recruitment to online methods only, such as email, social media, and word of mouth. Other limitations include relying on feedback from one type of stakeholder, current or alumnus DNP students, and creating a questionnaire using various methodologies, frameworks, and adaptations of other surveys with prior approval. This was mainly due to no literature that explicitly used a survey to assess the perspectives of the DNP student's experience. Additionally, results reflected a short timeline and a small number of participants, specifically for the focus groups.

### **Practice Implications**

DNP-prepared nurses are essential to improving healthcare systems through innovation, policy writing, healthcare advocacy, systems leadership, and scholarship-supported decision-making. They must efficiently translate evidence-based practice and nursing theory into improvements in direct patient care quality and safety (Moss, 2022; Robb, 2005). High-level DNP preparation is vital to the evolution of the nursing profession through the application of new knowledge (Moss, 2022; Robb, 2005).

Change and innovation must occur based on the results exhibiting dissatisfaction with the participant's overall experience. It is evident that DNP programs are tasked to provide DNP students with the core competencies as reported in *The Essentials of Doctoral Education for*

*Advanced Nursing Practice* and prepare nurses for the highest level of leadership in practice and scientific inquiry (AACN, 2006), have inconsistencies in their program infrastructure, program expectations, and of the DNP project process (Sun, 2019). These changes will require an overhaul of the DNP format, focus, purpose, quality, and dissemination of the final DNP project to improve rigor and sustainability. Key stakeholders need to revisit dialogue over curricular elements and competencies required of all Doctor of nursing practice programs and begin to discuss how to standardize the process.

### **Conclusion**

There are currently limited scholarly articles that examine the DNP project process and provide recommendations to implement innovation and standardization. However, research surrounding innovation implemented in other sectors and implementation of the Lean Six Sigma framework have been used to evaluate closely related processes with similar purposes and outcomes. The results from this project will build the foundation to inform the next phase and help advance clinical practice, academic programming, and policy. There is a tremendous opportunity for DNP programs to optimize their curricular elements and DNP project process to become experts in synthesizing research into practice and meeting nursing needs by implementing innovative bedside practices or improving the quality of nursing and system processes.

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## Appendix A

## Evidence Table

Search Criteria	Key Words
Key Search Terms Used	<ul style="list-style-type: none"> <li>• Subject terms were obtained from the CINAHL resulting in the following key words: Clinical Supervision (<b>CS</b>); Information Management (<b>IM</b>); Nursing Education (<b>NE</b>); Workflow (<b>WF</b>); Decision Support System (<b>DSS</b>); Education Technology (<b>ET</b>)</li> <li>• The following keywords were used in Google Scholar search: Doctoral Education (<b>DE</b>); Doctor of Nursing Practice (<b>DNP</b>); Enterprise Content Management (<b>ECM</b>); Scholarly Project (<b>SP</b>); Doctoral Supervision (<b>DS</b>); Supervision Pedagogy (<b>SPD</b>); Workflow Management System (<b>WMS</b>); Patient Portal (<b>PP</b>); Diffusion of Innovation (<b>DOI</b>).</li> <li>• <b>Note: Bolded abbreviations are used in Table 2</b></li> </ul>
Years/ Language	18+ years/English
Types of subjects	Mentors/Supervisors, graduate nurses
Search Engines	Google Scholar
Databases	PubMed, CINAHL
Professional Organizations	<ul style="list-style-type: none"> <li>• American Association of Colleges of Nursing</li> <li>• The National Organization of Nurse Practitioner Faculties</li> </ul>
Government & Regulatory Agencies	<ul style="list-style-type: none"> <li>• U.S. Department of Education: Office of Educational Technology</li> <li>• National Institute of Health</li> <li>• California Healthcare Foundation</li> </ul>
Other	

## Appendix B

## Student Recruitment Email



My name is Shade' Reid and I am a Doctor of Nursing Practice (DNP) student with Georgia State University. I am conducting a project to identify the gaps in the academic-clinical pathway that is experienced by DNP students during the DNP project process. The title is *Innovations to Improve the DNP Practice Environment: An Evaluation of the DNP Project Process*. I am specifically looking for feedback from DNP students about their experience in their role within the DNP project process. Institutional Review Board permission has been granted for this study.

STUDENTS- Your role in the electronic survey will last approximately 45 minutes for the survey. Once that is completed you will be asked to participate in voluntary focus group to answer some open-ended questions that further investigate your experience as a DNP student or alumnus of DNP program. To answer the open-ended questions, you will take part in one focus group session that will last approximately 1 hour. You will only be required to do this one time over the 7-month research period.

I greatly appreciate your time and willingness to assist me in collecting information about your experience with the DNP project process.

Follow the link below (or copy/paste the entire URL into your browser) to access the online survey. The link will close 2 weeks from date received so your prompt response is greatly appreciated.

Survey link: [https://gsu.qualtrics.com/jfe/form/SV\\_bvnrReOiScm0zFb](https://gsu.qualtrics.com/jfe/form/SV_bvnrReOiScm0zFb)

Your input is particularly important and will be used only for the purposes of this research project.

If you have any questions, please feel free to contact me at [ssmith209@student.gsu.edu](mailto:ssmith209@student.gsu.edu) or telephone me at 404-919-3484 or contact the PI, Dr. Kimberly A. Hires at 404-413-1177.

Sincerely,

Shade' Reid, MSN, APRN, CPNP-PC

## Appendix C

## Consent Form

**Georgia State University  
DNP Student Informed Consent**

Title: Innovations to Improve the DNP Practice Environment: An Evaluation of the DNP Project Process

Principal Investigator: Regena Spratling Ph.D., RN, CPNP, FAANP, FAAN

Student Principal Investigator: Shade' Reid, MSN, APRN, CPNP-PC

**Introduction and Key Information**

My name is Shade' Reid, DNP student at Georgia State University. I am doing research on the DNP project process and evaluating the current gaps in the DNP clinical-academic pathway. You are invited to take part in a research study. It is up to you to decide if you would like to take part in the study.

**Purpose**

The purpose of this study is to find the current gaps, particularly around technology infrastructure, in the DNP project environment process. The Doctor of Nursing Practice (DNP) is a clinical doctorate that requires substantial faculty mentorship, clinician preceptors, clinical practice partnership and support, and other DNP project resources. The current education model is essentially unchanged and poses many challenges to the academic institution, students, and clinic practice agency. We believe that you can help us by telling us your experiences and attitudes about the DNP project process. We want to learn what works and what does not work for you in your program as a DNP student because this knowledge might help us learn how to improve the DNP educational model and project process.

You are invited to take part in this research study because you are a current post-MSN DNP student in at least your second semester of your program and have identified a site where your project will be implemented. You can also be an alumni DNP student. The DNP program must be accredited by The Commission on Collegiate Nursing Education (CCNE) and the Accreditation Commission for Education in Nursing (ACEN). A total of 50 DNP (current or alumni) students will be invited to take part in this study.

**Participation**

Your participation in this study is entirely up to you. Your role in the study will last approximately 45 minutes for the survey. Once that is completed you will be asked to participate in a voluntary focus group to answer some open-ended questions that further investigate our experience as a DNP student or alumni of the DNP program. To answer the open-ended questions,

you will take part in one focus group session that will last approximately 1 hour. You will only be required to do this one time over the 7-month research period.

### **Procedure**

You will be asked to do the following:

- A. Sign this consent electronically via DocuSign Electronic Signature and Agreement Cloud platform. Once you agree to informed consent terms, you will be receiving a Qualtrics survey via personal email.
- B. This survey will be administered via Qualtrics Survey Software program. Once you consent, you will receive confirmation by email.
- C. Once the survey is completed you will be directed to a section that will request your voluntary participation for a focus group where open ended questions will be administered. You will be able to sign up via Acuity Scheduling web application that will be provided via email once you finish the Qualtrics survey.
- D. For focus groups you will be asked to take part in a discussion with 4-5 other persons with similar experiences. This discussion will be guided by student investigator (SI). The group discussion will start with the SI making sure that you are comfortable. The SI will also ask questions about the project that you are completing. Then the SI will ask you questions about your DNP experiences as a DNP student and the DNP project process at your institutions and give you time to share your knowledge. The questions will be about how you feel about your current DNP program, what problems are you encountering, and what changes, if any, would you make. We will also talk about your engagement with your project site and relationship with your preceptor at your project site. This will give us a chance to understand more about your experience as a DNP student.
- E. These are the types of questions that will be asked. We will not ask you to share personal beliefs or practices and you do not have to share any knowledge that you are not comfortable sharing. The discussion will take place online on a web conferencing platform, and no one else but the people who take part in the discussion and the SI will be present during this discussion. The entire discussion will be audio and video recorded and stored as a recorded link. The recorded session will then be transcribed via Wreally Transcribe transcription software ©. The information recorded is confidential, and no one else except the SI and PI will have access to the recordings. The recordings will be destroyed after the research concludes (12 months).

### **Risks**

There is a risk that you may share some subjective experiences or that you may feel uncomfortable talking about some of the topics. You do not have to answer any question or take part in the discussion/interview/survey if you feel the question(s) are too personal or if talking about them makes you uncomfortable.

### **Benefits**

This study is not designed to benefit you. Overall, we hope to gain more information about the DNP process and your participation will help us find out more about how to improve the current

education model. Your participation in this research is entirely voluntary. It is your choice whether to participate or not.

### **Future Research**

Researchers will remove information that may identify you and may use your data for future research. If we do this, we will not ask for any additional consent from you.

### **Compensation**

There is no compensation for participating in this study.

### **Voluntary Participation and Withdrawal**

You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You are not able to skip questions, but you may change your mind later and stop participating even if you agreed earlier. The choice that you make will have no bearing on your job, your role in your DNP program, or any work or school-related evaluations or reports.

### **Confidentiality**

We will keep your records private to the extent allowed by law. The following people and entities will have access to the information you provide:

Principal Investigator: Regena Spratling Ph.D., RN, CPNP, FAANP, FAAN

Student Principal Investigator: Shade' Reid, MSN, APRN, CPNP-PC

GSU Institutional Review Board

Office for Human Research Protection (OHRP)

The researchers will make every effort to ensure that the information you provide as part of this study remains confidential. Your identity will not be revealed in any publications, presentations, or reports resulting from this research study. However, it may be possible for someone to recognize your particular story/situation/response while participating in the focus group. While we will ask all group members to keep the information that they hear in this focus group confidential, we cannot guarantee that everyone will do so.

We will collect your information through video recordings, audio recordings, interviews, and Qualtrics. Online activities always carry a risk of a data breach, but we will use systems and processes that minimize breach opportunities. This data will be securely stored on a password- and-firewall protected laptop in a restricted-access folder on Dropbox, an encrypted, cloud-based storage system. This data will be kept for 12 months until the study is complete, and then it will be destroyed.

### **Georgia State University Disclaimer**

If you have any questions about this study or believe you have suffered any injury because of participation in the study, you may contact the Student Investigator, Shade' Reid at (404) 919-3484 or

email at [ssmith209@student.gsu.edu](mailto:ssmith209@student.gsu.edu) or the Principal Investigator, Dr. Regena Spratling at [rspratling@gsu.edu](mailto:rspratling@gsu.edu). Georgia State University and/or Children's Healthcare of Atlanta, however, has not set aside funds to pay for this care or to compensate you if something should occur.

**Contact Information**

The IRB at Georgia State University reviews all research that involves human participants. You can contact the IRB if you would like to speak to someone who is not involved directly with the study. If you would like to speak with someone directly involved in the study you can contact the Student Investigator, Shade' Reid at (404) 919-3484 or email at [ssmith209@student.gsu.edu](mailto:ssmith209@student.gsu.edu) or the Principal Investigator, Dr. Regena Spratling at [rspratling@gsu.edu](mailto:rspratling@gsu.edu). You can contact the IRB for questions, concerns, problems, information, input, or questions about your rights as a research participant. Contact the IRB at 404-413-3500 or [irb@gsu.edu](mailto:irb@gsu.edu).

**Consent**

You may save or print a copy of this consent for your records. If you are willing to volunteer for this research, please sign below.

_____	
Printed Name of Participant	
_____	_____
Signature of Participant	Date
_____	_____
Principal Investigator or Researcher Obtaining Consent	Date

## Appendix D

## Survey Tool

**Innovations to Improve the DNP Practice Environment: An Evaluation of the DNP Project Process****Inclusion Criteria**

Q1 Are you a current DNP student?

- Yes
- No

Q2 Are you an alumnus of an accredited DNP program (The Commission on Collegiate Nursing Education (CCNE) and the Accreditation Commission for Education in Nursing (ACEN)?

- Yes, I graduated > 12 months ago
- Yes, I graduated within the last 12 months
- No, I did not graduate/my DNP program is not accredited

Q3 When did you graduate?

- 1-5 years ago
- 5-10 years ago
- >10 years ago

Q4 Are you at least in your second semester of your DNP program?

- Yes
- No

Q5 To what degree do you anticipate practicing nursing after completing your DNP program?

- At a much higher level
- At a somewhat higher level
- About the same

Q6 Since completion of your DNP program, how are you using your degree in your nursing role?

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Q7 Have you identified your project site?

- Yes
- No

Q8 Have you continued the same project from your DNP program either at the same site or another site?

- Yes
- No

Q9 What was your project site when you were a DNP student?

- ICU/Step down floor
- Medical/Surgical floor
- Outpatient clinic-subspecialty
- Primary Care
- Surgery
- School-based
- Community/Public Health
- Hospice
- Other (please specify) \_\_\_\_\_

Q10 What type of institution will you implement your project?

- ICU/Step down floor
- Medical/Surgical floor
- Outpatient clinic-subspecialty
- Primary Care
- Surgery
- School-based
- Community/Public Health
- Hospice
- Other (please specify) \_\_\_\_\_

Q11 What is or what was your target population for your project?

\_\_\_\_\_

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### Demographics

Q12 What is your ethnicity?

- Caucasian
- African American
- Asian-American
- Hispanic/Latino
- Native American
- Asian/Pacific Islander
- Other, please specify \_\_\_\_\_

Q13 Please indicate your gender?

- Male
- Female
- Non-binary/third gender
- Other (please specify) \_\_\_\_\_

Q14 How old are you?

- ≤ 25 years of age
- 26-35 years of age
- 36-45 years of age
- 46-55 years of age
- 56-65 years of age
- 65 years of age

Q15 Are or were you considered a full-time or part-time student in the nursing doctoral program you are or were enrolled in?

- Full time
- Part time
- I transitioned at some point during the program between the two

Q16 On average, how many hours a week do you work, if any?

- 0-5 hours
- 5-10 hours
- 10-15 hours
- 15-20 hours
- 20-25 hours
- 25-30 hours
- 30+ hours

Q17 Are or were you enrolled in an online program, a traditional on-campus program, or a hybrid nursing doctoral program (both online and on campus features)?

- Online
- Traditional
- Hybrid

Q18 What is your clinical nursing background? (Select all that apply)

- ER
- Medical-surgical
- Pediatrics
- OB/Gyn- Women's Health
- ICU
- Community/Public Health
- Psychiatric
- Inpatient/Acute care
- Outpatient specialty
- Outpatient Primary Care
- Other, please specify

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### Likert Scale

Q19 The following statements concern your attitudes toward learning and your nursing doctoral program, which includes your coursework, the project phase. All questions refer to DNP program that you are currently enrolled in or graduated from. Please respond to the following items by indicating the degree to which the statement reflects your views and experiences using the scales provided. All data will be handled anonymously, your responses will not be associated with your name or any other identifying information.

Answer the 6-point scale below:

How much do you or did you like your Doctor of Nursing Practice program?

- Extremely satisfied
- Moderately satisfied
- Slightly satisfied
- Neither satisfied nor dissatisfied
- Slightly dissatisfied
- Moderately dissatisfied
- Extremely dissatisfied

Q20 The following statement is answered on a 6-point scale, from strongly disagree to strongly agree:

Having a program that provides flexibility is crucial for reducing the stress of my DNP program.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q21 Differing expectations between program faculty, preceptors, and my own expectations has caused me stress during my nursing doctoral program.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q22 Working in isolation during my nursing doctoral coursework, or in my capstone or change project has caused me stress.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q23 The overwhelming nature of my capstone or clinical change project phase has caused me stress.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q24 Your institution has a well-developed system to foster quality evidenced based projects.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q25 Faculty members demonstrate fulfillment of diverse faculty responsibilities and roles, including teaching, research, service, and mentoring.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q26 Faculty members devote significant time to students' clinical change project from development to dissemination.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q27 DNP project infrastructure is appropriate for facilitating evidenced based quality improvement and education.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q28 There are or were enough number of faculty members to facilitate learning.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q29 The program has or had a process in place that fosters socialization of students to doctoral education and facilitates interaction among students and between faculty and students.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q30 Sufficient materials and information are available for students.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Q31 The school has various sources of funding for students' DNP projects.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

**End of Block: Likert Scale**

**Start of Block: Evaluation of Technology Infrastructure**

Q32 Which of the following digital devices do you use? (Select all that apply)

- Simple cell phone (without web access)
- Personal Digital Assistant (Blackberry, etc.)
- Smart phone (iPhone, Android, etc.- has web access)
- Laptop or desktop
- Tablet (iPad, tablet, etc.)

Q33 The following statements concern your frequency in your use of the technology as a current DNP student or DNP alumni. All questions refer to DNP program that you are currently enrolled in or graduated from. All data will be handled anonymously; your responses will not be associated with your name or any other identifying information.

How often do or did you use an electronic device (mobile phone or tablet/iPad) for the following activities?

	Always	Often	Sometimes	Rarely	Never
Creating spreadsheets or charts (i.e., Excel, etc.)					
Creating presentations (i.e., PowerPoint or Keynote, etc.)					
Accessing Course management system (i.e., Blackboard, Canvas, WebCT, Moodle, etc.)					
read/create/send Email					
read/create/send instant/direct messaging					
Creating E-portfolio					
Accessing social networks (Instagram, Facebook, LinkedIn, etc.)					
Access webcast/podcast/blog					
Creating/managing video/audio recording software (Loom, Kaltura, WebEx, Zoom, etc.)					
Access a library or DNP project resource on an official college or university library website					
Writing documents for your coursework					
Meet with DNP Project team members or external experts					

Q34 How often do or did you use a desktop or laptop computer for the following activities?

	Always	Often	Sometimes	Rarely	Never
Creating spreadsheets or charts (i.e., Excel, etc.)					
Creating presentations (i.e., PowerPoint or Keynote, etc.)					
Accessing Course management system (i.e., Blackboard, Canvas, WebCT, Moodle, etc.)					
read/create/send Email					
read/create/send instant/direct messaging					
Creating E-portfolio					
Accessing social networks (Instagram, Facebook, LinkedIn, etc.)					
Access webcast/podcast/blog					
Creating/managing video/audio recording software (Loom, Kaltura, WebEx, Zoom, etc.)					
Access a library or DNP project resource on an official college or university library website					
Writing documents for your coursework					
Meet with DNP project team members or external experts					

Q35 Are/were any of the following technologies used in your DNP courses?

	No	Yes
Email		
Instant/direct messaging		
Course/learning management system (i.e., Blackboard, Canvas, WebCT, Moodle, etc.)		
Presentation software (PowerPoint, etc.)		
Course Web site		
Library resources (PubMed, CINAHL, etc.)		
Online social networks (Instagram, Facebook, LinkedIn, etc.)		
Webcast		
Video/audio recording software (Loom, Kaltura, WebEx, Zoom, etc.)		
Podcast		
Blogs		
E-portfolios		
Spreadsheets (Excel, etc.)		

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Q36 If your DNP program, DNP project team, and clinicians/faculty related to your DNP project could communicate with you in any form, what would your first choice be?

- Instant messaging
- Email
- Text messaging
- personally authenticated Web site (portal)
- Paper mail
- no preference

Q37 What is/was your skill level using the following computer technologies and applications?

	Poor	Fair	Good	Very Good	Excellent	Do/did not use
Spreadsheets (i.e., Excel, etc.)						
Presentation software (PowerPoint, etc.)						
Video/audio recording software (i.e., Loom, Zoom, WebEx, Kaltura, etc.)						
Online library resources						
Computer maintenance (downloading software updates, installing additional memory, organizing files, etc.)						
Course/learning management system (Canvas, blackboard, Typhon, Med Hub, Moodle, Blackboard, etc.)						

Q38 During the academic year, what is/was your most frequently used method to access the internet? (Select all that apply, up to 3 methods)

- Commercial dial up modem service (AOL, Earthlink, etc.)
- College- or university-operated dial up modem service
- Commercial broadband service (DSL modem, cable modem, etc.)
- College- or university-operated wired broadband service
- Commercial wireless network
- College- or university-operated wireless service
- Mobile data (internet you receive from mobile service provider)
- I do/did not access the internet

Q39 I prefer/preferred taking DNP courses that use:

- No information technology
- Limited information technology
- Moderate level of information technology
- Extensive level of information technology
- Exclusively use information technology

Q40 Please give us your opinion about the following statements regarding your experiences in your DNP courses.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am more engaged in courses that require me to use technology than in course that do not require me to use technology					
Overall, my instructors use/used information technology well in my courses					
My school needs to give me more training on the information technology required to use in my courses					

Q41 The use of technology in my DNP courses:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Helps me better communicate and collaborate with my DNP project team, classmates, and faculty than in courses that do not use technology.					
Results in more prompt feedback from my instructor than in courses that do not use technology.					
Allows me to take greater control of my course activities than in course that do not use technology.					
Helps me develop a more robust DNP project in the clinical environment compared to having limited or no use of technology					

Q42 How would you describe your overall experience using a course/management learning system?

- Very negative
- Negative
- Neutral
- Positive
- Very Positive

Q43 Which of the following benefits from using information technology while developing your DNP project and in your DNP courses was valuable to you?

- Improved my learning
- Convenience
- Helped me manage my course activities
- Helped me manage my DNP project
- Helped me communicate with my classmates and instructors
- No benefits

Q44 The use of information technology in my DNP program has improved my learning.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Q45 Which of the following best describes you?

- I love technologies and am among the first to experiment with and use them.
- I like technologies and use them before people I know.
- I usually use technologies when most people I know do.
- I am usually one of the last people I know to use technologies.
- I am skeptical of new technologies and use them when I have to.

Q46 How do you learn best?

- I learn best working alone
- I learn best working with others
- I learn equally well working alone and working with others

Q47 How do you like to learn?

	Yes	No
I like to learn through text-based conversations over email, instant/direct messaging and text messaging.		
I like to learn through programs I can control such as video games, simulations, etc.		
I like to learn through contributing to websites, blogs, wikis, etc.		

Q48 What's your personal email? (No work or school email. Personal email is only used if we have further questions regarding the project)

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## Appendix E

## Focus Group Questions

1. What are the strengths and weaknesses/problems of the curriculum and learning environment of your doctoral program?
2. What are the strengths and weaknesses/problems of the quality of faculty of your doctoral program?
3. What are the strengths and weaknesses/problems of the resources of your doctoral program?
4. What methods are used by DNP students (you) to overcome barriers to progression through the DNP program?
5. What factors do DNP students perceive as supporting progress through the DNP program?
6. What factors do DNP students perceive as hindering progress through the DNP program?
7. From your perception, what are pros and cons of going back to school to obtain your DNP?
8. How would you go about standardizing DNP programs?
9. Are there any other factors that have impacted your doctoral experience?