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# Creating an Interactive DNP Project Repository: A Model for Change

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Creating an Interactive DNP Project Repository: A Model for Change

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## Section I

### **Background, Scope, and Relevance**

The changing demands of the United States' complex healthcare environment require the highest level of scientific knowledge and practice expertise to assure quality patient outcomes. Nursing education is undergoing a transformation in doctoral education in order to meet the increasingly changing complex healthcare needs. From 2002 to 2011, the number of students enrolled in doctor of nursing practice (DNP) programs in the United States increased from 70 to 8,973. During that same period, the number of DNP graduates increased from 70 to 8,973. As of 2011, there are 153 DNP programs enrolling students at schools of nursing nationwide, and an additional 160 DNP programs are in the planning stages (AACN, 2011). DNP programs are available in 37 states plus the District of Columbia. States with the most programs (more than five) include Florida, Illinois, Massachusetts, Minnesota, New York, Ohio, Pennsylvania, and Texas (AACN, 2006).

As of 2012, there are 153 DNP programs enrolling students at schools of nursing nationwide, and an additional 160 DNP programs in the planning stages. DNP programs are now available in 37 states plus the District of Columbia. States with the most programs (more than five) include Florida, Illinois, Massachusetts, Minnesota, New York, Ohio, Pennsylvania, and Texas. From 2009 to 2010, the number of students enrolled in DNP programs increased from 5,165 to 7,034.

During that same period, the number of DNP graduates increased from 660- 1,282 (AACN, 2011). Doctor of Nursing Practice programs: The number of schools offering the DNP has increased from 20 in 2006 to 184 in 2011, with another 101 programs in the planning stages.

Enrollment in these programs grew by 28.9% in 2011, with 9,094 students now enrolled in DNP programs (AACN, 2012).

Schools nationwide that have initiated the DNP are reporting sizable and competitive student enrollment. Employers are quickly recognizing the unique contribution these expert nurses are making in the practice arena, and the demand for DNP-prepared nurses continues to grow. The need to incorporate best practices for the improvement and transformation of healthcare necessitates utilizing technology and innovation. Leaders in the healthcare field are moving to re-conceptualize educational programs that better prepare today's health professionals. The Doctor of Nursing Practice degree provides nurses with the necessary knowledge and skills needed to redefine best educational practices. This conceptual model includes using the Essentials of Doctoral Education (AACN, 2006), a document that defines the theoretical framework.

On October 25, 2004, the member schools affiliated with the American Association of Colleges of Nursing (AACN) voted to endorse the Position Statement on the Practice Doctorate in Nursing, which called for moving the current level of preparation necessary for advanced nursing practice from the master's degree to the doctorate level by 2015. This shift in teaching levels and requirements has led to the rapid development of the DNP program. With this change, there has been a growth and subsequent explosion of evidence-based treatment studies and research done by DNP students for their final projects that provide an opportunity for a new standard of information sharing.

In October 2010, the Robert Wood Johnson Foundation's (RWJF) Initiative on the Future of Nursing at the Institute of Medicine (IOM) Foundation released a historic report with eight major recommendations for healthcare delivery systems improvements. The second

recommendation is to, “Expand opportunities for nurses to lead and diffuse collaborative improvement efforts” (RWJF, 2010). It challenges nurse leaders to provide systems change, using the most up-to-date technology platforms to advance current evidence-based outcomes in nursing education systems.

In the past, individual schools catalogue and store data from their doctoral students individually, which can be accessed through their university libraries. The innovative use of a new platform using informatics technology to enhance systems access to evidence-based practice outcomes of DNP final projects can provide nurses, and other members of a healthcare team, more rapid contact to this clinical information that can develop practice outcomes. This implementation would also promote advanced nursing practice at the highest level of clinical expertise.

Another influential group working to incorporate informatics is the Alliance for Nursing Informatics (ANI). This group is a collaboration of organizations that acts as a unified voice for nursing informatics (NI). ANI represents more than 5,000 nurse informatics groups and brings together 24 distinct NI groups in the United States. ANI crosses academia, practice, industry, and nursing specialty boundaries and works in collaboration with the nearly three million nurses in practice in 2011. ANI’s position is that “meaningful use” of health information technology (HIT), when combined with best practice and evidence-based care delivery, will improve healthcare for all Americans. HIT is an essential foundation for the future of nursing, and informatics nurses must be engaged as leaders in the effective use of information technology to impact the quality and efficiency of healthcare services (ANI, 2009).

The creation of systems that can provide bridges to information technology requires rethinking old ways of doing business. In the past, individual universities and colleges would

accommodate theses and dissertations on their library sites. Some of these sites are public and can be accessed by everyone, while some require university-specific affiliation. DNP graduates are distinguished by their abilities to use information systems/technology to support and improve patient care and healthcare systems and provide leadership within healthcare systems and/or academic settings (Zaccagnini, 2011). This project aims to apply knowledge and skills related to information systems and technology.

The Technology Informatics Guiding Education Reform (TIGER) Initiative was designed to address a skill set needed for all nurses in the 21st century (Hebda, 2010). The skill set includes informatics competencies that range from basic computer skills to advanced-level information technology and literacy competencies. Transformation of education requires integrating informatics systems applications, such as the creation of a new centralized database for DNP final projects.

### **Theoretical Framework**

DNP-prepared nurses go beyond simply applying evidence into practice and actively evaluate the results of this application. They generate practice-based knowledge not only by evaluating existing applications but also by developing new applications from the evidence. DNP-prepared nurses will be practitioner-researchers who are prepared to play a major role in transforming, not just applying, their newly gained knowledge (Vincent, 2011).

The organizational theoretical framework of knowledge translation has two overlapping domains of practice. The DNP-prepared practitioner-researcher and the PhD-prepared scientist-researcher. Boundaries between these two groups are not rigid, and they are overlapping. The influence of the doctoral-prepared nurse's role is broadened by DNPs working closely with PhDs in knowledge generation and implementation/dissemination studies. This relationship provides

added value to nursing, and the increase of doctor-prepared nurses making changes to nursing practice benefits the profession as a whole. Scientific knowledge continues to grow exponentially, and the need for translating this knowledge into clinical practice has never been greater. DNP graduates must be prepared in rigorous doctoral curricula to address this need. As practitioner-researchers, DNP graduates are context experts who will be key in closing the research-to-practice gap and improving health outcomes in the United States (Vincent, 2012).

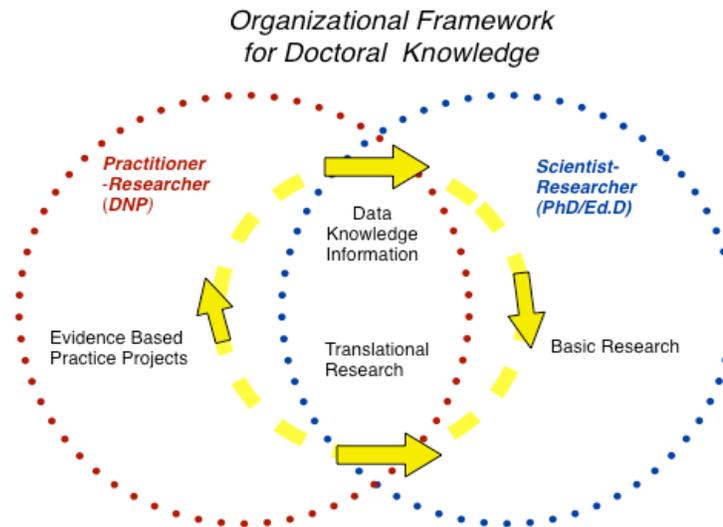
Rogers' Diffusion of Innovations theory (2003), which provides a conceptual framework for understanding the process of the adoption of new practices or technologies and the associated social changes, was used. Rogers' work indicates that in facilitating the adoption of an innovation it is important to help the community of potential adopters and other stakeholders participate in the process, clarify their understanding of the innovation, and reduce uncertainty. This translates into developing materials and communication channels that provide information and opportunities for input from various stakeholders. (AACN). The Deans and Directors survey was an attempt to involve stakeholders in the adoption of a new model of storage for DNP final projects.

In addition, *Disruptive Innovation* theory identified by Christenson and colleagues (2004), offers a unique approach to introducing innovation. The innovation focuses on disruption of the competitive landscape rather than incremental, semi radical, and very radical innovations that affect both the technology and business model. (O'Grady & Malloch, 2011). A healthcare example of disruptive innovation occurs when a new technology is designed to transform the ability for information exchange using a specially designed application, a database for DNP using innovative information technology. The development of new methods for practice, using Health Information Technology (HIT) operations can increasing availability of

data from DNP final projects to others most quickly, This can serve as a more powerful method of information exchange, using the power of the internet; improving the process of translation of knowledge to practice and education.

Conceptual underpinnings in a framework of *Knowledge Translation* developed by Vincent ET al.conceptualizes the emerging field of translational research.

An organizing model derived from translational research depicts a central circle, with overlapping circles indicating two domains—that of the scientist-researcher, traditionally the domain of the PhD-prepared nurse, and that of the practitioner-researcher, conceptualized as the domain of the DNP-prepared nurse. Boundaries are not rigid, allowing individual interests, experience, and pre- and postdoctoral opportunities to create roles. However, the purpose of developing the practitioner-researcher role is to broaden the influence of doctoral prepared nurses throughout the process of basic discovery to the improvement of health outcomes. The inner circle represents phases of the translational research process (Vincent, 2011). The Organizational Framework for Doctoral Knowledge Translation has been adapted with permission, from authors, and has integrated into it the flow of Nursing Informatics to include Data, from DNP final Projects-which becomes- Information- to Knowledge to-Translation to Practice.



## Definition of Terms

*AACN essentials.* DNP Essentials 1 through 8 are the foundational outcome competencies deemed essential for all graduates of a DNP program regardless of specialty or functional focus.

*Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care.* Demonstrate the conceptual ability and technical skills to develop and execute an evaluation plan involving data extraction from practice information systems and databases. Their abilities to use information systems/technology to support and improve patient care and healthcare systems, and provide leadership within healthcare systems and/or academic settings.

***DNP Final Project.*** The final DNP project produces a tangible and deliverable academic product that is derived from the practice immersion experience and is reviewed and evaluated by an academic committee. The final DNP product documents outcomes of the student's educational experiences, provides a measurable medium for evaluating the immersion experience, and summarizes the student's growth in knowledge and expertise. (AACN, 2006).

***Nursing informatics (NI)*** is a specialty that integrates nursing science, computer science, and information. Science to manage and communicate data, information, knowledge, and wisdom in nursing practice. NI supports consumers, patients, nurses, and other providers in their decision-making in all roles and settings. This support is accomplished through the use of information structures, information processes, and information technology (ANA, 2008).

***Database.*** A collection of data organized so that various programs can access and update the information.

***Health Information Technology.*** Comprehensive management of health information across computerized systems

***Data.*** The raw material of information. Refers mostly to the information entered into, and stored within a computer or file.

***Database.*** A collection of data organized so that various programs can access and update the information.

***Data Processing.*** Operations performed on data to provide useful information to users.

***Digital.*** Refers to information processing techniques that convert the actual data into binary (or machine language) code for more efficient transmission and storage. To retrieve the information, the binary code must be converted back to an analog signal.

***Health and nursing information science*** is the study of how health care data is acquired,

communicated, stored, and managed, and how it is processed into information and knowledge. This knowledge is useful to nurses in decision-making at the operational, tactical, and strategic planning levels of health care.

***Informatics.*** Informatics is the discipline focused on the acquisition, storage, and use of information in a specific setting or domain. To me, what distinguishes informatics from information science and computer science is its rooting in a domain.

***Information systems.*** Used in health care include the people, structures, processes, and manual as well as automated tools that collect, store, interpret, transform, and report practice and management information. *Information system* is frequently used to refer to the interaction between people, processes, data and technology. In this sense, the term is used to refer not only to the information and communication technology (ICT) that an organization uses, but also to the way in which people interact with this technology in support of business processes.

***Information Technology (IT).*** The technology involving the development, maintenance, and use of computer systems, software, and networks for the processing and distribution of data

***Nursing Informatics (NI)*** is a specialty that integrates nursing science, computer science, and information science to manage and communicate data, information and knowledge to support health care outcomes. This support is accomplished through the use of information structures, information processes, and information technology (ANA, 2008).

***Host.*** A computer connected to the Internet that allows users to connect to it.

***Operating System.*** A group of computer programs that help manages the computer's resources. It acts as an interface between the computer and its application programs. The operating system's job is to control the computer on the most fundamental level: it manages memory, controls access to peripheral devices and serves as a translator between the user and the

hardware, providing the means for the user and application programs to tell the hardware what to do.

***Interactive DNP Final Project Repository.*** For storage of data, information and Doctor of Nursing Practice Projects.

***Translational research.*** A developing science translating evidence based research to practice. The ability to successfully translate new research findings to the clinical setting and in turn the generation of new knowledge from the clinical setting itself and further research as needed. This flow of information goes from DNP Clinical Practitioners to PhD Research Practitioners.

### **Assumptions and Risks**

The assumption is that a centralized repository would be of value to the profession, and the risk would be that the project would not provide a valuable mechanism as envisioned. Although the findings of this project are convincing, there is an assumption that there is a need for a centralized repository for DNP final projects, the risk is that the repository would not provide added value.

### **Summarize Project Goals and Expected Outcomes**

With the growth of the DNP clinical doctorate programs, and final outcome projects there is a need for specialized DNP database for a new method of data entry and retrieval for DNP's. A distributed database is a set of interrelated files that can store data (Tolea & Bolyai, 2010).

The creation of a resource specific to DNP students and faculty can provide easier access to evidence-based projects. Specialization of this database to help track trends and projects of DNP students from different DNP programs and can later be a source for research into the quality and outcomes of DNP final projects across the country. As schools implement the new

DNP programs, student submissions of evidence-based projects have increasingly become a standard graduation requirement. DNP program final projects are a varied and valuable sources of original, evidence-based projects related to current identified clinical, administrative, and educational issues identified. DNP students' final projects are only available to a select few. In academia, there is a constraint to use the systems created by the institution. Often this is not accessible easily by people outside of that particular institution.

Knowledge translation, translational research, is a necessary step for dissemination and application of findings. DNP prepared nurses can contribute to leading change, and improving systems to enhance quality improvement and outcomes utilizing the best IT systems and innovation.

As of 2012, there is no simple, standardized method to store, compare, analyze, or even study these important and innovative final project student submissions. The only method to retrieve these projects is to contact each DNP program and request access. This is not utilizing IT and systems development, to reach the largest audience. Creation of a specialized database system and data retrieval process for advanced practice nurses and professionals can transform nursing practice and education to utilize the most up to date technology expertise, and reach the largest audience. This database would grant healthcare professionals access to project findings, for the purposes of education, and replication and dissemination of findings can enhance the utilization of the evidence. Dissemination of findings, and possible replication applicable to their specific setting. The process of translating evidence to practice is the method in which healthcare systems care changes. DNP's are leading this change however; IT can further enhance the speed in which change occurs.

The purpose of this project is to gather input from Deans and Directors of DNP programs through a specialized survey tool. This will aid in identifying valuable input from stakeholders as related to the perceived purpose and value of creation of a centralized electronically accessible database for DNP student final projects.

A database can be defined as a set of basic or structured data accessible to a community of users. A distributed database is a set of interrelated files that can store data (Tolea & Bolyai, 2010). The creation of a resource specific for DNP students and faculty can provide easier access to evidence-based projects. Specialization of this database to help track trends and use projects of DNP students from different DNP programs as sources for research into the quality and outcomes of future DNP final projects across the country.

One of the American Association of Colleges of Nursing's (AACN) eight essentials of doctoral education for advanced nursing practice is organizational and systems leadership for quality improvement and systems thinking (2006). This essential includes identifying needs for designing and integrating methods for enhancing the use of technology and information to be applied to education and practice. Creation of a new information technology (IT) platform for DNP final projects can enhance advanced education and nursing practice at the highest level of clinical expertise.

As schools implement DNP programs, evidence-based project submissions are increasingly becoming a standard graduation requirement. Unfortunately, the number of DNP student final projects – a valuable collection of original evidence-based projects and forward-thinking solutions to a wide variety of healthcare delivery and policy design – are only available to a select few. As of 2012, there is no simple, centralized method across University systems to

store information in order to access these important and innovative final projects, except to attempt to contact each DNP program and request access.

A repository system process for advanced practice nurses and professionals can transform nursing practice and education to utilize technology expertise to gain access to the findings, for purposes of education, and replication and dissemination of findings can enhance the utilization of the evidence. The purpose of this project is to develop consensus as to the valuable aspects related to the creation of a centralized electronically accessible databank for DNP final student projects. The goal is to provide a shortened pathway to get DNP final projects' evidence-based outcomes easily accessible for people within and outside the DNP program. The creation of an easily reached display place could build a bridge to help cross the roadblocks other database systems contain. Additionally, DNP students in programs across the country could easily access what other students have submitted as final projects, from which they could build on ideas or adapt project criteria to meet the needs of their individual settings.

## **Section II**

### **Literature Review**

A review of the literature was conducted by a hand search of journals, papers, and citation tracking. An electronic search was done tracking databases, titles, abstracts, text, and book chapters. Reviews of empirical and non-empirical studies were reviewed. Abstracts of citations were reviewed for topic relevance, and inclusion criteria. When met, the specific articles were retrieved in full to be included in this systematic review.

The in-depth literature review utilized the following online search engines and publications: CINAHL, Medline, Pub Med. Ehost.com, Medline, IOM reports, and AACN

publications. Keywords for the search included doctoral education, doctor in nursing practice, health information technology, innovation and technology, and nursing informatics.

To help explore this large heterogeneous body of knowledge, the review of literature included three broad areas: the doctor of nursing practice, HIT, nursing informatics, leadership and innovation, and translational research. Other areas also explored included quality and safety in healthcare, and nursing education. Articles included were white paper reports that addressed the history and expansion of the DNP degree; relevant documents from the AACN, IOM reports, journals, online sources, and books. Some of the evidence reviewed was older than five years, which is important to note because relevant history relating to HIT and NI was important to include tracing the development of the field, related to the topic.

A number of keywords were used in various combinations to identify relevant articles, including doctorate in nursing practice, and clinical doctorate, education, and nursing. Position statements from professional nursing and medical organizations were included were included. Additional keywords searched were innovation in healthcare, translational research, doctoral education, and social networking and innovation.

The systematic review of the literature included a “snow ball” method, including a hand search of journals, papers, citation tracking, and electronic search using CINAHL, Medline, and scholarly repositories of the University of San Francisco, theses and dissertations databases, titles and abstracts, text, book chapters, and a library search of books. Abstracts of citations were reviewed for topic relevance and inclusion criteria. When met, the specific articles were retrieved in full, to be included in this systematic review. The format used for evaluating the articles for this systematic review included, “Why?” “What?” “When?” and “Where?” Each article was weighted as to relevancy to this topic using scoring as low, medium and of high worth.

**Discussion**

The purpose of the systematic review was to explore the best available evidence on DNP program development and the infrastructure for storage of DNP final projects. To address this question, qualitative studies using a myriad of methodologies such as phenomenology, descriptive/exploratory, participatory action research, grounded theory and hermeneutics were identified. Multiple studies and reports on the history of the DNP were reviewed. The review of the evidence stimulated questions on a number of areas: How can the use of IT applications lead to helping transform healthcare? Can the use of an IT database repository help the process of translating evidence to practice and education?

Are some of the recommended standards of NI being incorporated into education and practice? How can we build an infrastructure to add to knowledge in EBP coming from the work of DNP students, which in turn supports the use of HIT in education and practice?

**Statement of Need**

Informatics is already having a profound effect on how the healthcare industry catalogs and shares information. By creating a more efficient means to aggregate and share information, the use of informatics systems in DNP education will improve accessibility to critical thinking, advancing the translation of evidence to practice, and will provide a shorter pathway to adopting the creative new evidence emerging from DNP final projects. Development of an integrated DNP final project repository to enhance EBP and building use of informatics in nursing education will advance nursing practice and keep pace with other industries utilizing the power of technology to enhance the business of nursing.

## **Background and DNP History**

The IOM report *Crossing the Quality Chasm* (2001) was a landmark study focusing on improving healthcare and reducing errors. Recommended competencies for today's healthcare professionals included improved interdisciplinary teams, integration of quality improvement standards, and utilizing IT systems.

The AACN's *DNP Essentials* document (2006) addresses the eight recommended criteria for all DNP programs, which are: (a) Scientific Underpinnings for Practice; (b) Organizational and Systems Leadership for Quality Improvement and Systems Thinking; (c) Clinical Scholarship and Analytical Methods for Evidence-Based Practice; (d) Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care; (e) Health Care Policy for Advocacy in Health Care; (f) Interprofessional Collaboration for Improving Patient and Population Health Outcomes; (g) Clinical Prevention and Population Health for Improving the Nation's Health; and (h) Advanced Nursing Practice.

Specialty competencies are areas that will prepare DNP graduates to assume a variety of roles. There are two general categories of specialty competencies: (a) Roles that specialize in the care of individuals as an advanced practice nurse (APN); and (b) Roles that specialize in practice at an aggregate, systems, or organizational level. Specific competencies and contents for the specialty competencies are defined by the specialty organizations. These competencies complement, and are incorporated into, the eight core DNP Essentials. They are sometimes referred to as *direct* or *indirect* roles (e.g. nurse practitioner, educator, executive/administrator, or policy role). Upon graduation, all DNPs fill leadership roles to improve and change healthcare practices and systems outcomes, and to improve healthcare of the population.

In a follow-up report, the IOM Committee on the Health Professions Education states, “All health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches, and informatics” (IOM, 2003). Developing new innovative systems to reflect the needs of today’s healthcare system entails recreating models of education and practice.

The RWJF’s *Initiative on the Future of Nursing* report identified major recommendations for healthcare delivery systems improvements (2010). One of these recommendations is to expand opportunities for nurses to lead and diffuse collaborative improvement efforts and challenges nurse leaders to provide systems change, using the most up-to-date technology platforms to advance current evidence-based outcomes in nursing education systems (2010). In addition, the objectives set forth by the 2010 Affordable Care Act represent legislative change to conduct a major overhaul of healthcare. With nursing being the largest segment of the nation’s healthcare workforce, nurses can play a vital role in helping to realize the goals of the Affordable Care Act (IOM, 2010).

Nurses today have an opportunity to play a central role in improving quality and transforming the way Americans receive healthcare. The IOM report recommends expanding opportunities to lead and diffuse collaborative improvement efforts (IOM, 2010). In recognition of this imperative, leaders in the healthcare field are moving to conceptualize educational programs that better prepare today’s health professionals. In addition, the use of innovative technology to disseminate findings to clinical settings can be aided by creating new systems support and an infrastructure for evidence-based practice findings from DNP final projects.

In their continuous efforts to improve healthcare, both the public and private sectors have invested, and continue to invest, in HIT. When used appropriately, HIT can improve the

performance of health professionals, reduce operational and administrative costs, and enhance patient safety (IOM, 2012). Overall, the literature on HIT and its effects on patient safety have been inconclusive.

In the report *Health IT and Patient Safety: Building Safer Systems for Better Care* (IOM, 2011) the IOM examined literature on HIT products and their effects on patient safety. Overall, the committee findings about HIT literature were inconclusive. Some HIT applications were successful in improving patient safety, however, the results are not easily generalizable due to IT applications being so varied in different settings. The report showed worrisome concerns due to lack of standardization of HIT designs. Creating an infrastructure for a DNP database can enhance the translation of evidence-based practice outcomes and improve quality and safety in healthcare.

In the evaluation of systems, it is important to recognize that the HIT is not used in isolation, but as part of the socio-technical system that also includes clinicians, patients, organizations, processes, and the external environment. Comprehensive analysis of effectiveness of systems needs to consider the system as a whole, and design systems with sensitivity to the many impacting factors.

### **Need for Translational Research**

As practitioner-researchers, DNP-prepared nurses can help close the research-to-practice gap, thus improving quality of care, by engaging in translational research. DNP-prepared nurses must bridge the gap between research and practice by learning to critically analyze evidence and design and implement evaluation studies including Quality Improvement, implementation/effectiveness, and dissemination studies and/or clinical projects (Vincent, 2011).

According to AACN Essential III, Clinical Scholarship and Analytical Methods for Evidenced-Based Practice, DNP graduates must be equipped with skills to (a) critically assess the suitability of evidence for implementation into practice, (b) design and implement process and outcome evaluation studies within a practice setting, and (c) be QI leaders.

### **Health Information Technology and Nursing Informatics**

As HIT is central to healthcare reform, and nurses comprise the largest group of clinical users of HIT systems, nurse executives must play a critical role and remain engaged throughout the lifecycle of system selection, implementation, and optimization. Additionally, the healthcare team will look to the nurse executive to drive adoption and articulate the goals and anticipated benefits of the technology implementation to guide healthcare reform (TIGER Leadership Report, 2007).

The TIGER vision for leadership was defined at a 2006 summit as the state of “revolutionary leadership that drives, empowers, and executes the transformation of healthcare through the use of IT.” Two action steps were identified to help achieve the leadership vision: Create leadership, management, education, and development strategies to support nursing leaders in transforming care through technology initiatives; and identify strategies to increase the power, influence, and presence of nursing leadership in IT initiatives, both locally and nationally, at their own organizations, through their professional organizations, as well as governmental and legal bodies (TIGER Leadership Report, 2007). Nursing education is changing, and informatics infrastructure is being incorporated nationwide at varying levels. The needs to further integrate practices utilizing the best IT and systems by using data mining to collect and store evidence effectively is a goal for an integrated DNP database system.

Another primary goal of the TIGER Initiative is to engage more nurses in the development of a national healthcare information technology (NHIT) infrastructure (TIGER Collaborative Report, 2007). The best return comes from utilization of the data to change practice patterns, to enhance improving EBP, and to create systems to improve quality, safety, and education.

An informatics infrastructure is essential for evidenced-based practice. Building blocks of an informatics infrastructure for evidence-based practice need to include the following: standardized terminology and structures, digital sources of evidence, standards that facilitate healthcare data exchange among heterogeneous systems, informatics processes that support the acquisition and application of evidence to a specific clinical situation, and informatics competencies (Bakken, 2001). Each of these components supports the application of evidence to practice, as well as the building of evidence from practice.

### **Translation of Evidence from Research to Practice**

The gap between translation of evidence of research findings and their application is growing. Healthcare education programs are emphasizing inter-professional collaboration and translational research as a means to reduce this research-to-practice gap. Healthcare providers (HCP) must be able to translate newly discovered relevant scientific knowledge into their provision of healthcare and navigation of healthcare systems to improve patient and systems outcomes (Vincent, 2012). The timeliness of this practice can be enhanced by digitized sources on platforms that are readily accessible. DNP programs' curricula guide students to become leaders in implementation and dissemination into practice. Collaboration in the 21st century is essential between the DNP and PhD, and other clinical experts.

The contributions of these findings provide evidence that there is a need to create

infrastructures and transformative systems, to bridge EBP research into clinical practice with the appropriate technology solutions for organizational and educational transformations. My project goals were to survey participation from leaders and stakeholders of DNP programs related to the perception of a need for a DNP final project database for the purposes of translational research to practice. In addition, the posting of current abstracts available on the DNP community website was to engage DNPs in education and practice about the usability of the abstracts in current format online in the LLC. It was an attempt to see how useful this platform was for end users

### **Section III**

#### **Implementation**

The DNP course of study culminates in a scholarly project, at the conclusion of the doctoral program (AACN, 2004). Collectively, these final projects are a valuable source of original evidence of scholarship. Currently, access is neither convenient nor centralized, in a data system, which reflects the best utilization of technology and innovation available. By creating a more efficient means to aggregate and share information, the use of informatics systems in healthcare education will improve access to application of evidence to practice. The purpose of the survey was to identify the perceived need of a DNP final project platform for Doctor in Nursing Practice (DNP) final student projects.

After receiving approval from the Institutional Review Board of University of San Francisco, the Director/Dean of Nursing with current DNP programs were contacted via email to invite them to participate in a DNP survey. The survey goal was to identify information and interest, about the perceived value for a collective DNP final project database. The survey included descriptive demographic statistics, and some open-ended questions.

The second part of the project was an intervention aimed at translational research practice. In addition to a survey of deans and directors regarding DNP projects and project posting, DNP graduates will be invited to review abstracts of DNP projects that have been voluntarily posted on the Doctors of Nursing Practice website <http://www.doctorsofnursingpractice.org/studentprojects.php>.

DNP graduates who have joined the Doctor of Nursing Practice community will be invited to participate in a review of the posted abstracts. Participants will be told their contributions are valuable to building an interactive electronic database of DNP projects.

Participants will be asked to voluntarily respond to these three questions:

1. Please share how your review of this DNP project abstract was of value to you?
2. How did the content influence your thoughts on your practice?
3. Please share your thoughts on how reviewing a DNP project is valuable to growing the profession and improving outcomes.

Subject Consent: Participation is voluntary, consent is conferred as a result of participation; answers will be aggregated anonymously.

### **Project goals**

Project goals were to identify perceptual trends among nursing leaders To promote the use of best practices in HIT and NI and explore best possible systems to enhance translational outcomes related to the DNP EBP final projects. In addition, to add to identifying current status of individual schools feedback related to building an infrastructure in nursing education utilizing informatics and HIT.

IRB approval, by USF was received for the implementation of the DNP survey, and the Discussion board posting of abstracts.

The project has the potential to advance systems innovation, and demonstrate interest/consensus on a database for final DNP projects from different colleges and universities.

## **Section IV Project Evaluation**

### **Part 1: Deans and Directors Survey**

A 10-question survey (Table B) was sent to gather evidence related to the need for a centralized repository for DNP final projects. Comparisons of survey results were examined for significance statistical significance on selected items. Out of a total of 248 people who were sent the link, 68 people clicked onto the email sent, a total of 27.4% open rate. A total of 34 people clicked onto the survey and responded, with a 13.4% response rate.

Out of the sample surveyed 67% of the respondents were DNP program Directors/Coordinators, 8.8% were Dean of Nursing, 11.8% Dean of Graduate Studies and 11.8% were in “other” positions (Graduate program coordinator, Associate Dean for Graduate Program, Professor, Associate Dean for DNP program).

11.8% of programs starting admitting students between 2005-2006. 64.7 % admitted students between 2007-2010. 20.6% admitted students between 2011-2012. 85.3% graduated between 0-50 students in 2011, 14.7% graduated between 51-100 students as of December 2011.

Out of the Deans and Program Directors who responded to survey, 84% felt that there was important value for an interactive DNP final project database. 11.8% felt it was of average value.

93.9% responded they would support having a link to upload DNP projects on school website. AACN website 41.9%, Doctors of Nursing Practice, Inc. web site 32.3%, Proquest dissertation and theses 25.8%, University based 12.9%, Sigma Theta Tau 6.5%.

Chi-square goodness of fit analysis was used to compare the frequencies of responses for questions 6 and 8.

Question 6 - What is your perception of value to your students, of an interactive DNP final project database? For question 6, there was a statistically significant difference in the numbers of participants choosing the different responses,  $\chi^2 (4)=30.412, p \leq 0.05$ .

Question 8 - In your opinion, where should this database be housed? Frequencies of responses significantly differed for question 8 as well,  $\chi^2 (5)=29.784, p \leq 0.05$ .

Table 1

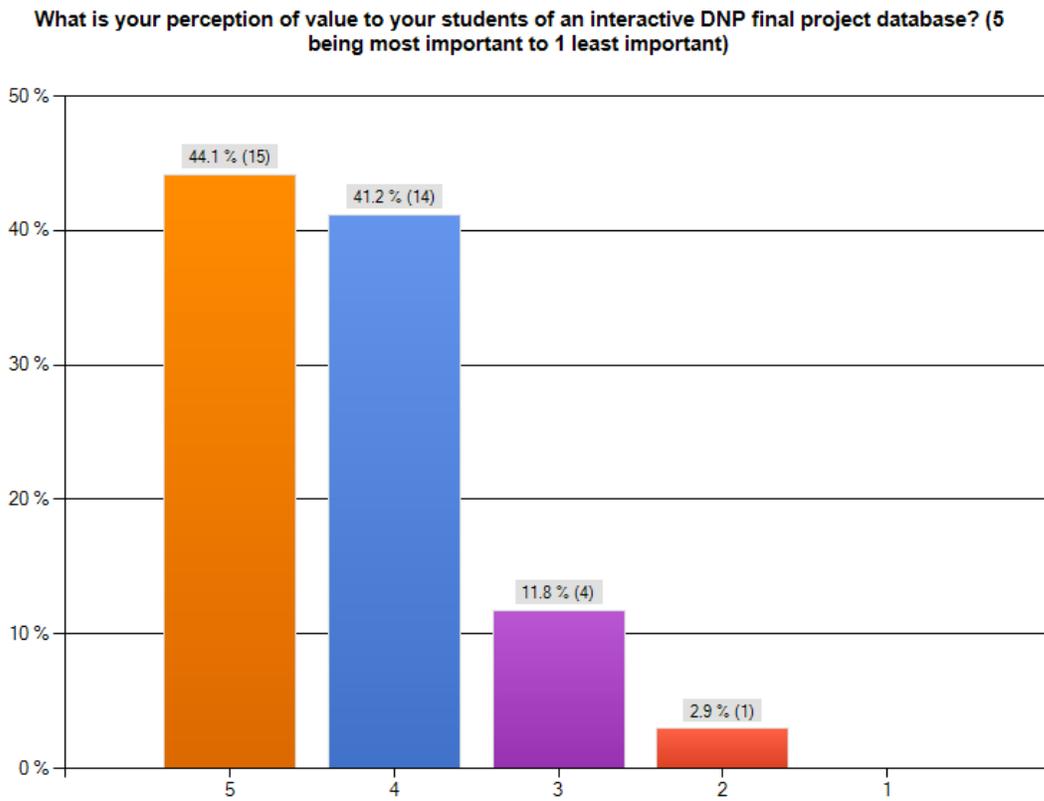
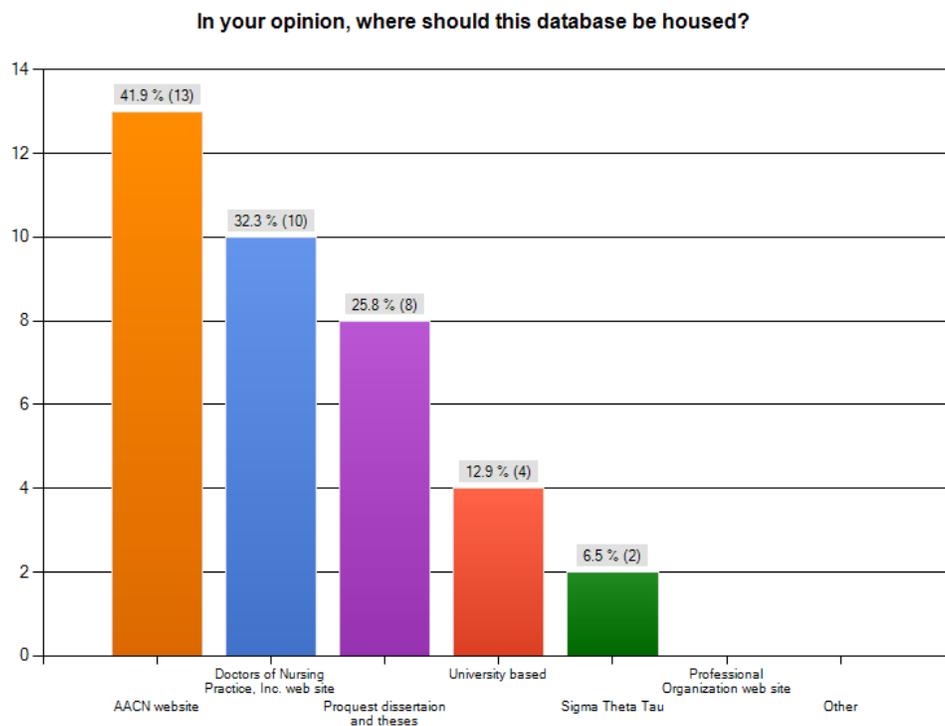


Table 2



The final 2 questions of the survey contained some open-ended questions, to gather qualitative data from the participants of the survey. Identified themes related to the topic were valuable in order to capture perceptions. Qualitative findings of the survey described how a centralized database might improve nursing education and practice. The themes included

developing the repository for storage of information, in order to gather collective knowledge and information to help students, educators and clinicians to translate evidence to practice.

The following are comments made by survey participants:

***Help build the practice research.*** By the support of building EBP students can learn through sharing of ideas, giving the opportunity to further studies, which have been completed. Increase the depth and scope of studies by building on previous studies. Build collective knowledge/wisdom, for DNP practice, and practice outcomes. Provides information for students in DNP Projects to see the breadth of projects as well as foster ideas. Will create a pool of translational research. There can be replication of projects, which may help to solidify our knowledge base. As with a centralized database of dissertation work, the final projects can reflect original scholarship and guide system change. Dissemination of knowledge, Encouraging innovation, quality care, process improvement, and evidence-based practice leads to evidence based practice and further study and research. Sharing good and promising practices, it could help to standardize outputs from all programs, would expand the knowledge base and provide a springboard for replication and refinement of these projects in other settings. One part of the definition of scholarship is that it is public and peer reviewed. It allows faculty and students to enhance nursing scholarship along with sharing the findings since many of these projects may not be published.

***Convenient access threads:*** Having one place to house DNP final project will make it convenient for future DNP students to find projects and get ideas on what to do for their capstone project. Help develop shared norms about expectations, DNP students beginning a new program will be able to find out what other students have done. There can be replication of projects, which will help to solidify our knowledge base. Provides

examples of projects. I think we also need to start thinking about how we can efficiently and effectively build culminating projects. So one project could be completed at multiple sites by DNP students, Easy access to current, relevant practice-related topics. Easy access to current, relevant practice-related topics. It will provide a venue to retrieve scholarly reports for clinical practice innovation.

*Standards for program evaluation:* the scope of the project varies greatly from DNP program to program. Having a centralized repository was viewed as valuable for a number of reasons. It would help to gather program input (data) in order to evaluate outputs. From all programs would expand the knowledge base and provide a springboard for replication and refinement of these projects in other settings. One part of the definition of scholarship is that it is public and peer reviewed.

## **Part 2: Discussion board posted abstracts: Translation of evidence**

Currently, there is an open source online DNP LLC, with over 3000 members, it is open to all educational backgrounds, not exclusively DNP's. It is an active web-based site, with varied diverse resources, and content. One area house DNP abstracts of final projects. Five individuals were contacted for permission to use their posted abstract for a discussion board question that was posted related to the specific abstract. The questions were related to the value of the abstracts posted.

The platform to present the abstracts did not lend itself to an open dialogue as expected. One of the characteristics of an on-line forum includes the opportunity to communicate at will on topics of personal interest. It is not an ideal vehicle to promote and guide discussion designed to test an idea. The participant typically joins in a discussion that motivates or challenges. Perhaps

the posting of abstracts with the request to provide feedback did not pique interest in the on-line community members.

The abstracts were brief summaries of projects performed by DNP students and scholars. The summary may not have provided enough information to challenge the on-line community member. Similarly, the expectation of providing an abstract on a specific topic to an on-line community member can at best hope to randomly capture the member's interest.

The questions asked were designed to elicit a response from an interested viewer. Perhaps the questions were not reflective of the concerns or interests that a viewer may have when viewing an abstract. The overarching goal was to elicit how DNP colleagues would or could apply findings from scholarly projects into their practice. The questions asked perhaps were not as direct and succinct as they could have been to elicit these responses.

### **Sustainability of the project**

#### **Continuous Quality Improvement Plan**

Issue	Recommendation	Plan
Feasibility/Cost Effective/Sustainable The need for Appropriate organizational structures	Develop a coherent organizational structure with clear lines of reporting and authority. Assessment of subscription service for repository	Establish an individual for accountability for quality of information Further needs analysis for system development

The need for Appropriate Information System	Develop a repository that ensures timely and quality information is made available. Consider: the strength of the research design; the Quality of the data Collected; relevance of The findings for improving clinical practice	Design categories of information clinical, policy, leadership systems Institute a web based knowledge management portal that provides timely, quality information on process and outcome indicators to allow for standard development and monitoring within repository
The need for an Effective Communication System and Structure	Develop an effective communication system And structure that ensures quality and timely communication through appropriate channels	Formalize mechanisms for communication: ·Written and verbal referral systems For end-users, Structured and regular
Develop mechanism For feedback of End users	Identify barriers ongoing, And make changes as necessary	Ongoing review of use of system, including end-user feedback
The need for Appropriate Regulatory systems	Develop appropriate regulatory systems	Establish professional self-regulatory bodies (peer review) for nursing · Identify indicators of standards and set time frames within which to achieve those standards

Feasible	Centralized location TBD	Survey end users re: best location of centralized repository
	Content management	
Sustainable	System	Identify best practices for content management for repository

## Section V Implications for Systems Leadership

### Summary

Nursing leaders in education and practice incorporate innovative ideas for the 21-century from our socio- technical society. In order to use best practices in NI and innovation, we need quality designs that consider cost saving, and collaboration, bridging the gap of education to practice by use of smart technologies and systems.

The goal of this project was to identify if there was a need for a new web based knowledge management system to provide easy centralized access to EBP from final DNP projects, *Creating An Interactive DNP Repository: A Model for Change*.

Nursing informatics is a specialty that integrates nursing science, computer science, and information science to manage and communicate data, information and knowledge to support health care outcomes. This support is accomplished through the use of information structures, information processes, and information technology (ANA, 2008). In evaluating effectiveness of structure, processes and outcomes, in relation to DNP final projects, there is a need for innovation, creativity, and new systems development to improve integration. Identification of systems, which can monitor quality and effectiveness in nursing and informatics practice need to be developed. The engagement in the development, implementation and evaluation of systems and practice is a functional area for nurse informatics leaders.

The integration of NI in designing an Interactive DNP Repository can facilitate the flow from data- information –knowledge-wisdom- to practice. Enabling the Health Care professional to use EBP more quickly, and redesign interventions based on their practice settings. Innovative systems that store digital sources of information of evidence or knowledge can enhance the dissemination of findings into practice and research.

With the rapid development of the DNP programs across the United States, the question is how can the role of IT aid in disrupting the current healthcare system and create a more integrated approach to DNP final project storage systems? Is the way data is currently stored on other databases and university websites the best way to disseminate findings? The question of scholarship in practice challenges us to look at how we are conducting business, and evaluating whether is it the best practice. There is growing recognition that there is a gap between research findings and application to practice.

The survey results showed interest from Deans and Directors as to the value for a centralized information system database for DNP final projects. The awareness was that there is a noteworthy value to a centralized repository for nursing DNP project's, ease of access links to professional oversight. Some of the ideas acknowledged were further defined when participants responded to a survey question as to how a centralized repository could enhance nursing education and practice?

Some main themes included the sensible nature of housing projects in one place for others to easily access. In addition, the content of what could be shared in a centralized repository would include a vehicle for dissemination of knowledge, improving quality of care, and the depth and breadth of innovation occurring among DNP students. It provides value for future students as well, to be able to build on prior research and knowledge obtained by others working in similar practice settings, This is turn can lead to further evidence based practice study and research. Sharing knowledge and skills learned adds to collegiality in the profession, providing examples of projects can provide ways for others to duplicate a project at multiple settings, building further collaboration. It is a venue for retrieving scholarly reports for clinical practice innovation. The project varies greatly from program to program, it would help build

standard outputs from all programs, and provide a body of knowledge for future research and evaluation of practice. Building collective wisdom about DNP practice and practice outcomes can help solidify original scholarship, and guide system change. The students need to view wide examples on a wide variety of topics as they develop ideas for their projects. Sharing nursing scholarship along with distribution of findings can build unpublished knowledge, and growing the DNP profession. The Repository can keep updated on the evolving of DNP scholarship across the country, quantifying and qualifying the types of DNP work being conducted.

The question of where the Repository is housed is a question of further discussion and research. Two centralized places had the most interest for survey participants. The AACN website (41.9%), and the DNP LLC (32.3%) website. Further study and collaboration on creating the repository, and system for sharing centrally, will be part of my post-doctoral work.

IT provides other additional tools for interactive methods such as discussion boards, blogs etc., that healthcare leaders can use to share information. Analysis of ways different college and universities store DNP final projects, has led the researcher to believe that an interactive system can be created. For greater effectiveness. The need to identify practices that can incorporate organizational and systems leadership for quality improvement and systems thinking (AACN, 2006) is a high priority. The use of technology and information for improvement and transformation of healthcare can be enhanced by disruptive innovative systems.

A quality repository system using health IT begins with user- centered design principles and adequate testing and quality assurance. This can be integrated with other current modes of social networking available, such as discussion boards, blogs, twitter, face book, online DNP LLC, apps for smart phones. The use of “smart” repository systems combined with socio-

technical trends of today can help deliver information most successfully. Creating systems to allow easy transfer and use of information about the DNP final projects can help enhance EBP and help transform nursing and healthcare. The repository system aids in building nursing knowledge, and can aid in evaluation research by centralizing findings.

The overall goal for the Quality and Safety Education for Nurses (QSEN) project is to meet the challenge of preparing future nurses to have the knowledge, skills and attitudes (KSAs) necessary to continuously improve the quality and safety of healthcare systems. As a DNP educator, innovation to enhance EBP by creating better informatics systems helps meet recommended standards by professional organizations including the ANA, IOM, AACN, and QSEN groups. The value of a shared repository enhances knowledge transfer, and helps to build quality for EBP translation and/or further research by students or healthcare providers and leaders.

The United States is undergoing a major transformation of its healthcare delivery system, driven by federal health IT investments and healthcare reforms. In healthcare, disruptive innovation aims to replace the current healthcare model — whose inaccessibility, unaffordability and unsustainability impacts every person in this country — with a more cost-efficient, patient-centric model (HIMMIS, 2012).

While traditional technology developers focus on their own efficiency and effectiveness, disruptive innovators build products that are more convenient to use, easier to access or more affordable to a new set of users who either didn't have the expertise or funds to buy existing products. As history has shown, new companies lead each wave of decentralization because disruptive innovation occurs in the marketplace's outer tiers (HIMMIS, 2012).

The rich knowledge and information is building from the DNP final projects from graduating students. As a profession, we need to learn from other disciplines, and apply best practices to nursing. The purpose of the DNP database system will be the aggregation, storage and ready dissemination of evidenced-based practice (EBP) projects. The initial users would be a DNP student to catalog their final senior DNP projects in a readily available and accessible format. DNP's in advanced practice, education and leadership roles in healthcare organizations and universities can provide the direction to their organizations that are capable of helping to bridge practice, education, and research. This will in turn foster leveraging of data and evidence for improving clinical practice, patient outcomes and population health. The goals of creating an innovative platform for DNP final projects using informatics, facilitates the goals of knowledge sharing and translation, also the potential for more rapid adaptation to practice and education. DNP student project findings can be the impetus for new DNP student's projects that may be looking for practice projects related to their specialty area. They can then in turn adapt, or replicate findings, evidence based practices found effective in their clinical setting. This in turn can translational practice, and redesigning research based on using evidence based outcomes from prior DNP final projects. In addition, the sharing of best practices with clinicians, educators, administrators and leadership, promotes building the nursing knowledge base and improving the contribution of nursing, by the expertise of DNP students and advanced practitioners.

Access is not convenient nor centralized, thus not reflecting the best utilization of technology and innovation available today. Translation of evidence to practice is a developing science, enhanced by digital evidence, and IT.

Informatics already has a profound effect on how the healthcare industry catalogs and shares information. By creating a more efficient means to aggregate and share information, the use of informatics systems in healthcare education will improve accessibility to critical thinking and provide a shorter pathway to adopting the creative new evidence emerging from DNP senior projects. The purpose of this survey is to identify perceived need of a National electronically accessible databank for DNP final student projects.

Five components are proposed as the building blocks of an informatics infrastructure for evidence-based practice: 1) standardized terminologies and structures (i.e., terminology models), 2) digital sources of evidence, 3) standards that facilitate health care data exchange among heterogeneous systems, 4) informatics processes that support the acquisition and application of evidence to a specific clinical situation, and 5) informatics competencies. Table 1 displays selected examples of how the building blocks support the application of evidence to practice and the generation of evidence from practice.

Tremendous progress in the development of the individual building blocks of an informatics infrastructure for evidence-based practice has occurred. In particular, sources of digital knowledge have rapidly increased. Representative sources are shown in Table 2 (with permission).

However, major challenges remain. These include development of a model that supports dissemination of digital sources of evidence, achievement of consensus standards for describing, organizing, obtaining access to, and archiving electronic information sources. Integration of the evidence-based practice infrastructure to support the context of evidence based practice. Development of an interactive component for information sharing and exchange to promote nursing practice and improve healthcare outcomes.

The future development of the database could include other clinical doctoral research, or projects, which can add to the body of evidence-based practice medicine and health care. Due to the limited amount of randomized controlled studies available on DNP Final project evaluation, there is a need to develop a way for more rapid translation of evidence to practice and education. A repository would also be useful to begin to evaluate the quality of DNP Final Projects and add to the body of nursing knowledge for future research and adaptation.

Health care Information Technology provides the means to the ends for safety, quality, and efficiency today and into the future. There will be continued need for workflow innovations and health care outcomes based practice and research. It is anticipated there will be more extensive requirements for both local and global sharing across organizations, more information sharing with consumers themselves, and transparency of organizational scorecards as compared to national benchmarks. This means tackling difficult issues such as interoperability and portability of electronic records for an institution(s) but regions also. Educators need to take leadership in adopting best innovative systems for information sharing to enhance healthcare outcomes, and educational processes.

My DNP project journey changed from my original goal. I was interested in scholarship, quality, and standards of practice outcomes in relation to the AACN essentials of practice. My analysis was to look at the projects, and compare outcomes across the different DNP programs.

The programs sometimes referred to as the ‘Seven Sisters’ included Case Western Reserve; University of Colorado, Columbia University; University of Tennessee; University of South Carolina, Rush.

As I attempted to gain access to findings of final DNP projects done at the varying as academic programs, I found there was a lack of a consistent method for accessing the

information. If you were an affiliate of the University, it might be available. What I found however was no uncomplicated way to look at programs across the United States. After contacting each of these schools individually, I began to see the lack of consistency in storage of DNP final projects. This made sharing of information limited as a larger body of evidence. As a result of my early research in a project for my own DNP program, the direction of my final project changed. Investigating the need for a DNP database system by utilizing HIT and NI became the focus of my final project.

The nursing informatics leader often serves as a catalyst for developing strategic plans, creating national or system policies and procedures, and serving as champion for complex projects and disparate system users (ANA, 2008).

As schools implement DNP educational programs, student submissions of evidence-based projects has become a standard graduation requirement for most DNP programs. These final projects are a valuable collection of original and forward-thinking solutions to a larger variety of healthcare delivery, leadership, and practice issues only available typically through an individual university library website.

Technological tools such as online discussion boards, can promote critical thinking, synthesis and self-directed learning. Translation of evidence via information obtained from DNP abstracts can disseminate information on evidence-based practice and ultimately provide safer client care in an improved healthcare system.

Exploring new technologies that enable efficient and effective written communication and professional collaboration is critical in today's educational and clinical settings. The US Institute of Medicine [16] recommends that health professionals be trained to use informatics in

order to 'communicate, manage knowledge, mitigate error, and support decision making using information technology'.

These technological tools have an educational value because they are convenient to use, ubiquitous, primarily open-source software, lead to social engagement professional collaboration, peer feedback and foster a sense of a 'learning community'.

The questions are how nurse informaticians can make use of them within their practice, education, or research, and whether applications specific to health informatics can be developed.

The United States is undergoing a major transformation of its healthcare delivery system, driven by federal health IT investments and healthcare reforms. At their joint presentation at the HIMSS12 Annual Conference & Exhibition in Las Vegas in February, Eric Dishman, General Manager of Health Strategy and Solutions at Intel Corporation, and Jason Hwang, MD, executive director of healthcare at the Innosight Institute, presented on the power of “disruptive innovation” to meet the challenges of transforming the U.S. health sector. Popularized by Harvard Business School Professor Clayton Christensen, disruptive innovation describes how the rapid introduction of new technologies, products and services can bring greater value at a lower price, engaging new consumers and displacing existing business methods. In healthcare, disruptive innovation aims to replace the current healthcare model — whose inaccessibility, unaffordability and unsustainability impacts every person in this country — with a more cost-efficient, patient-centric model.

It will take collaboration and disruptive innovation to architect the interoperability to connect this EBP data of DNP final projects, and to build a 21st century health IT infrastructure. We have to continuously innovate and adopt

technologies to create new models to integrate, translate, and transform findings of evidence by DNP final projects. There are databases available of outcomes of research findings of doctoral students. However, in the 21 century, the use of the most adaptive technology and systems creation, will help transform health care more quickly, and efficiently. Disruptive innovators can build interactive repository systems that are more convenient to use, easier to access and more efficient to users.

### **Dissemination Plan**

Plans for submission to conferences and professional journals are underway. On April 30, 2012, I will present at a Sigma Theta Tau Research meeting at University of San Francisco. I have plans to submit a poster presentation for the 5th National DNP Conference Evidence-Based DNP Education September 19-21, 2012. A plan for developing this project in collaboration with others will put this plan into action.

In addition, I am contributing to a book that has been accepted for publication describing my final DNP project. It is a section in the book; on an example of a DNP project which demonstrates organizational and systems leadership for quality improvement and advancing nursing practice. This is being published by Jones & Bartlett the Fall 2012.

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## Appendix A

## Systematic Review

Table 1

Topic	Author/Title	Year	Study findings	Weight the Evidence
DNP Programs	Graff, Russle, Stegbauer  Formative and summative evaluation of practice doctorate program	2007	Data collected from students in the program, and immediately before and 1 year after graduation to examine and compare formative and summative evaluation data provided by the students. Professional growth and development had been permanently and positively influenced.	high
HIT/ NI	Dixon, B., Newlon, C.  How do future nursing educators perceive informatics? Advancing the nursing informatics agenda through dialogue.	2010	Using online collaborations tools to integrate informatics into undergraduate nursing program. There is a need for universally accepted definition of informatics and a shared understanding of informatics core curriculum.	high
HIT/NI	Gloe, D.  Selecting and academic electronic health record.	2010	The author presents a plan for research, reviewing, and choosing and AEHR.	medium

HIT/NI	Hart, M.  A Delphi study to determine baseline informatics competencies for nurse managers.	2010	Produce a job specific list of informatics competencies for generic nurse manager positions. Need to develop associated tools for competency development and evaluation.	medium
HIT/ NI	Hebda, T., Calderone, T. What nurse educators need to know about the TIGER initiative.	2010	Designed to address a set of skills that is needed by all nurses. Nurse educators have adopted the TIGER plan to transform nursing practice and education to better prepare nurses to practice in a technology rich healthcare environment. TIGER is currently in phase III: implementation.	high
HIT/ NI	Huryk, L. Factors influencing nurses' attitudes towards healthcare information technology.	2010	Examine the current trend in nurses' attitudes toward HIT. Study concluded that nurses attitudes toward HIT are positive. Most common detractors are poor system design, system slowdown, and system downtime.	high

HIT/ NI	Jette, S., Tribble, D., Gagnon, J., Mathieu, L.  Nursing students' perception of their resources toward the development of competencies in nursing informatics.	2010	Nursing students perceive that their internal and external resources necessary to ensure "knowledge to act" in nursing informatics is moderately high. They exclaimed they lacked knowledge on using spreadsheet programs, presentation software, and courseware, about data security, and about how to analyze the quality of health related Web site and search electronic scientific data bases. Recommend that faculties and colleges focus on these elements.	high
HIT/NI	Kalisch, B.J., Begeny, S.  Preparation of nursing students for change and innovation	2010	Nurses need to be capable of creating innovative approaches, reacting quickly, and taking calculated risks. Using Organizational Engineering Model-information processing style predicts the ability to innovate, take risks, and change.	high
HIT/ NI	Liaw, S.T., Gary, K.  Clinical health informatics education for 21 <sup>st</sup> century world.	2010	Overview of using informatics in e-learning effectively to meet objectives of health informatics education	medium

HIT/ NI	Poe, S.S.  Building nursing intellectual capital for safe use of information technology: A systematic review.	2010	Systematic literature review conducted to answer the question, "What are the best practices to build nursing intellectual capital for use of IT for safe clinical care?" Evidence to support planned electronic health record rollout.	high
HIT/ NI	Turner, M. P.  Stratifying computer literacy: a Competency measurement strategy.	2010	Track nurse's ability to use and understand clinical data in clinical information system. Measure and track nurse's computer literacy to improve and enhance training programs. Using Benner's novice to expert approach, to increase adoption rate of electronic medical record.	medium
HIT/ NI	Walker, P.H.  The TIGER initiative: a call to accept and pass the baton.	2010	Using informatics to make health care safer, more effective, efficient, patient centered, timely and equitable. To do this technology must be integrated into nursing practice and education. Leaders must begin to nursing informatics and technology as core support to nursing functions, nursing decision making, and a new nurse- patient relationship.	high

HIT/ NI Leadership	Waneka, R., Spetz, J.  Hospital information technology systems' impact on nurses and nursing care.	2010	HIT improves quality of nursing documentations. HIT reduced medication admin errors. Nurse involvement in HIT designs and implementation, can improve HIT. HIT has positive influences on nurse satisfaction and patient care. Effective leadership positively influences development of HIT	high
Leadership	Farmer, L. A.  Situational leadership: A model for leading telecommuters.	2005	Situational leadership has been used in the traditional work setting and can be used in the virtual workplace. The strategies and techniques used have to be modified for the telecommuter and must focus on increasing communication.	high
Leadership	Heller, B.R., Drenkard, K., Herr, M.B., Romano, C., Tom, S., & Valentine, N.	2004	Design, implement, and evaluate an innovative model of nursing leadership development for students enrolled in registered nurse to bachelor of science in nursing or registered nurse to master of science in nursing programs. Evaluation data indicated that the course was considered valuable by students and with modifications suggested by students, faculty, and advisory panel members. Recommendations also included adapting course content to a continuing education format.	medium

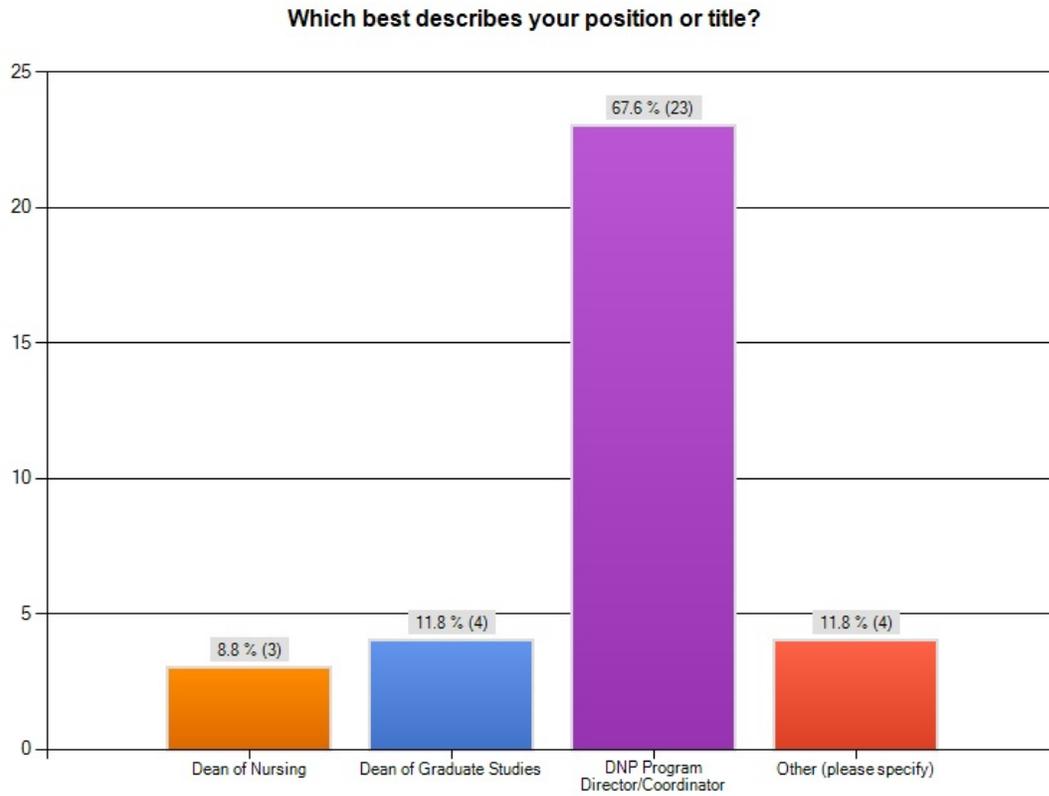
Leadership	Kenner, C., Androwich, I.M., & Edwards, P.A.  Innovative educational strategies to prepare nurse executives for new leadership roles.	2003	Using web based educational streaming to allow self paced learning. Developed to fit the new lifestyle of students and technology. Excelsior College has taken advantage of this digital age to bring together global nurse leaders and given them the opportunity participate self-paced learning at home.	medium
NI	Bosler, M. M.  Nursing informatics: Blazing new frontiers in clinical transformation.	2007	Informaticists must assess nurse-readiness for technology and quickly identify issues that might prevent user acceptance. Nursing Informatics professionals ensure that employees who will live with the changes are deeply involved in all aspects of project planning, vendor selection and implementation.	high
NI	Draye, M. A., Acker, M., & Zimmer, P.A.  The practice doctorate in nursing: approaches to transform nurse practitioners education and practice.	2006	Meeting the challenges of patient care using the practice doctorate curriculum for nurse practitioners, with focus on how it will prepare NP's as expert clinical with enhanced leadership and research skills. Doctoral preparation that blends the integrative nursing role with enhanced clinical, leadership, and research skills will position NPs to answer many of the needs and challenges facing the health care system.	high

NI	HIMSS Nursing Informatics Awareness Task Force  An emerging giant nursing informatics.	2007	As health care advances and technology floods the health care industry it is important that nurse informaticists work with other nurse specialties to insure nursing is enhanced by the emerging technologies.	high
NI	Sensmeier, J.  Survey demonstrates importance of nurse informaticist role in health information technology design and implementation .	2007	The majority of the 776 nurse informaticists who participated in this research continue to work in a hospital setting; 54% work at a hospital, and another 16% work at the corporate offices of a healthcare system. Respondents believe nurse informaticists will continue to have an impact on their organizations' decision-making process about implementing clinical software, the implementation of EHRs, and ultimately on improved patient care.	medium
NI	Simpson, R.L.  Nursing Informatics Patient safety: How information technology makes a difference.		The more informatics trained nurses there are using technology tools to improve productivity and care delivery, the less we spend on healthcare. It's classic economics with a nursing spin. Information technology is healthcare's brave new world, and informatics is the language of that land.	high

### Appendix B

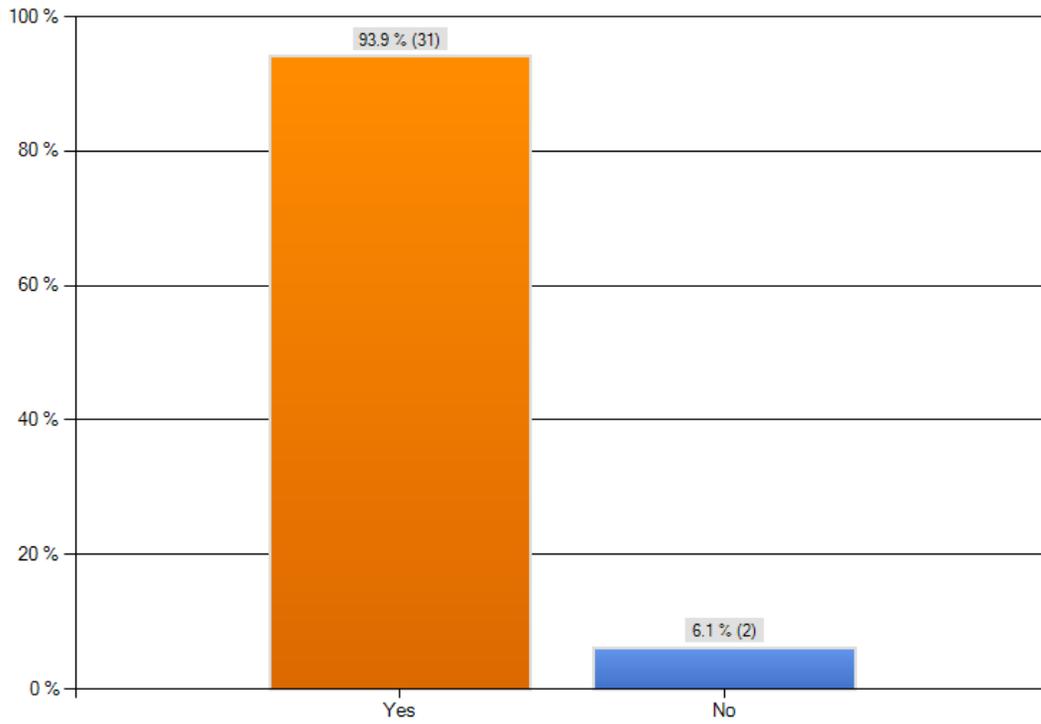
#### DNP Survey and Results

Table 1

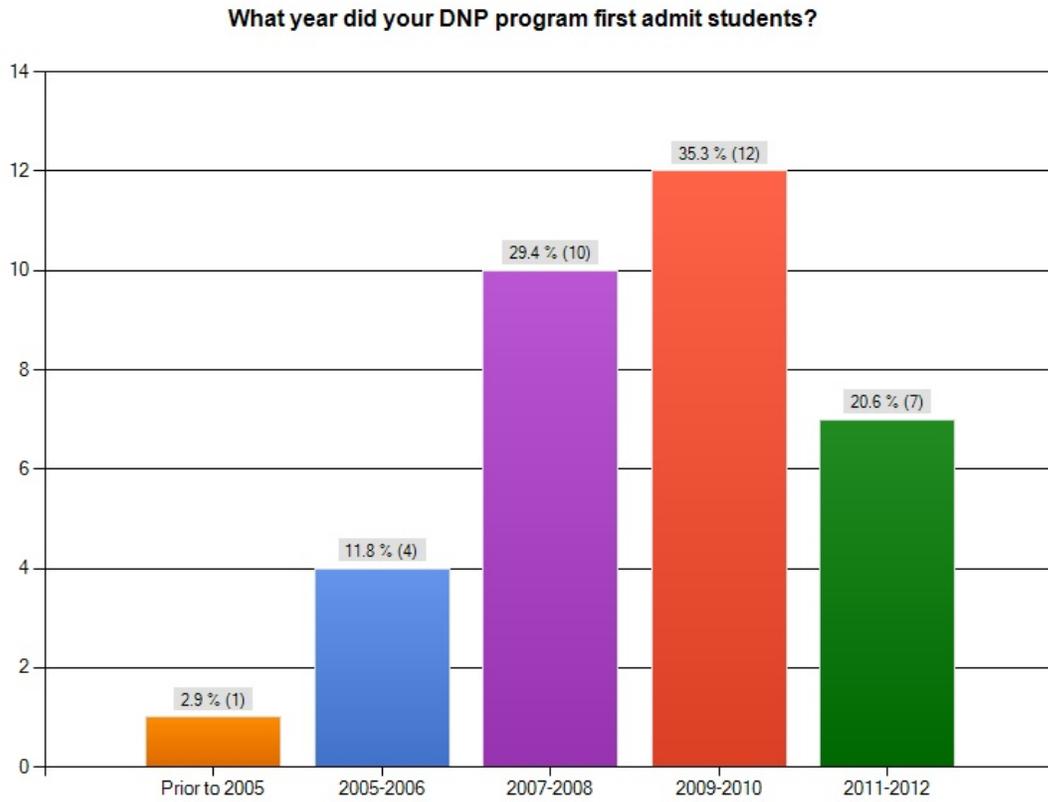


**Table**

**Would you support having a link on your nursing school website for students to upload their DNP project abstracts upon graduation?**



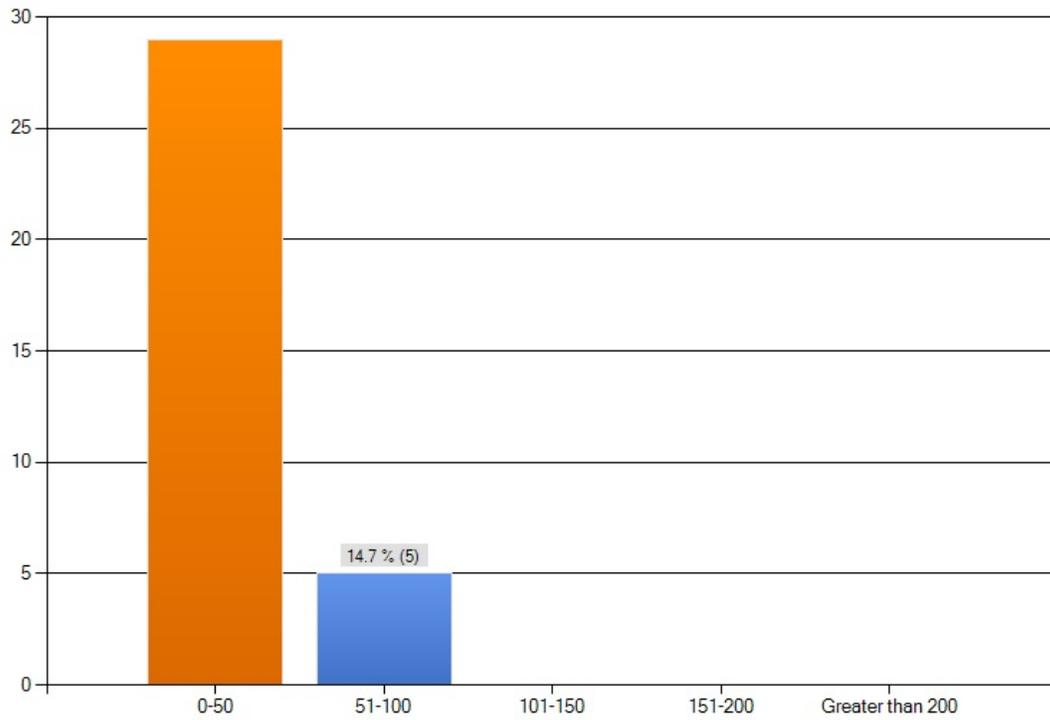
**Table**



**3**

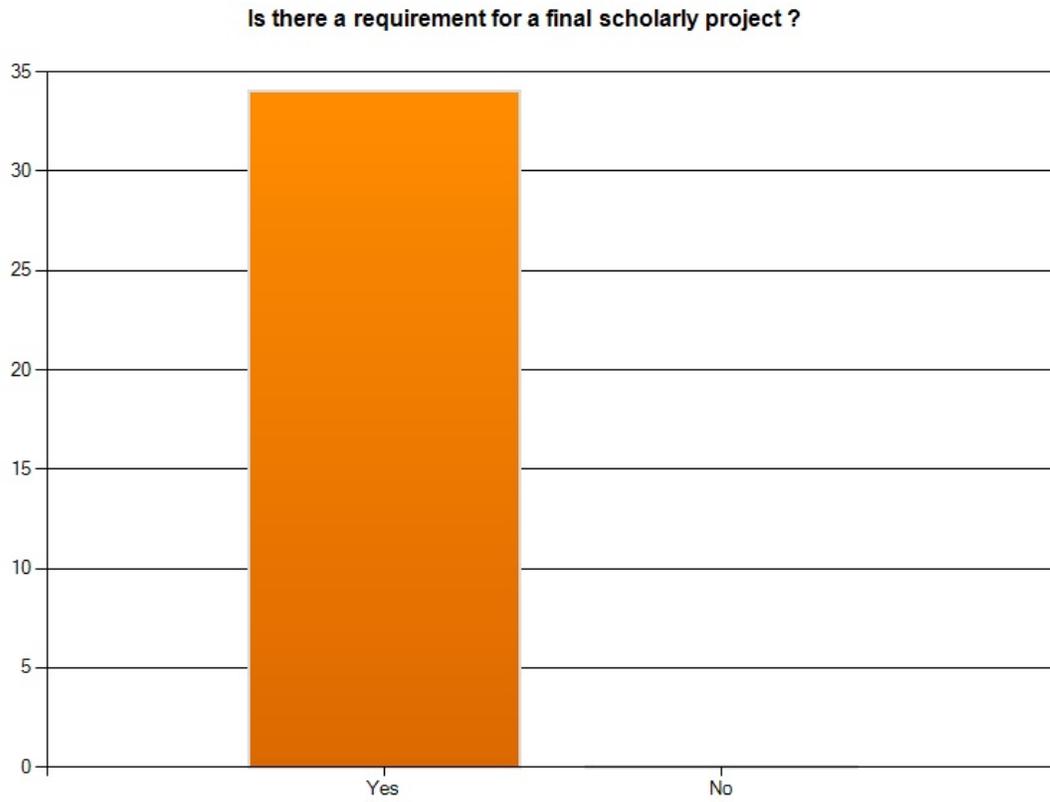
**Table**

**Approximately how many students have graduated from your DNP program as of December 2011?**



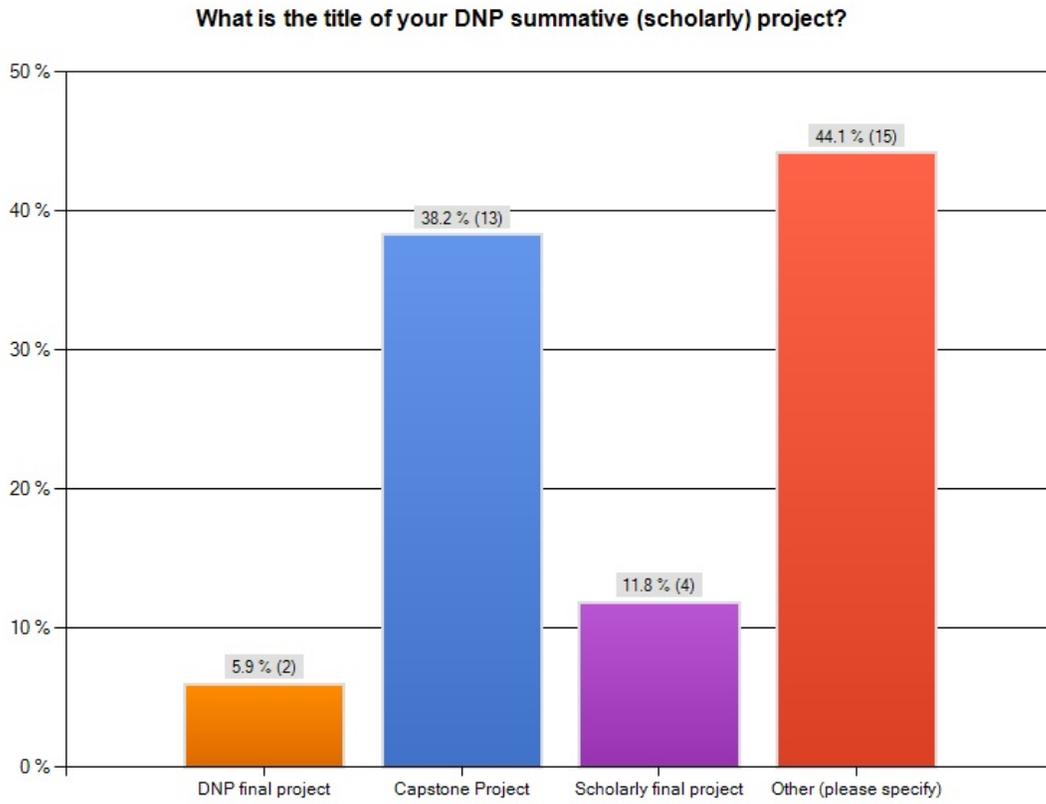
**4**

**Table**



**5**

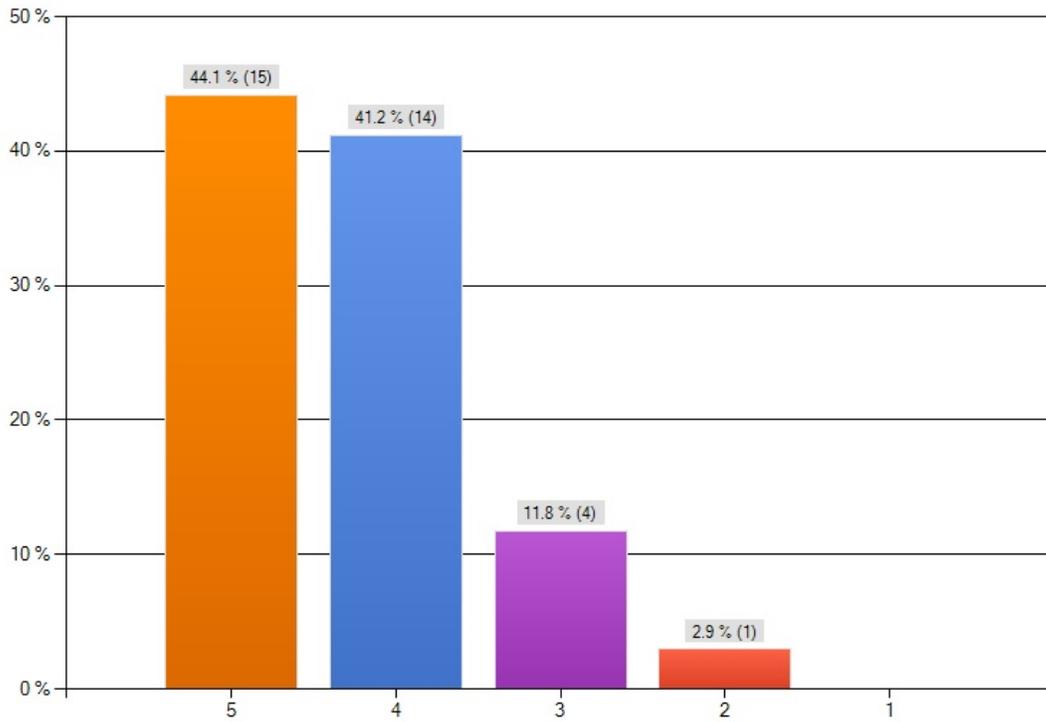
**Table**



**6**

**Table**

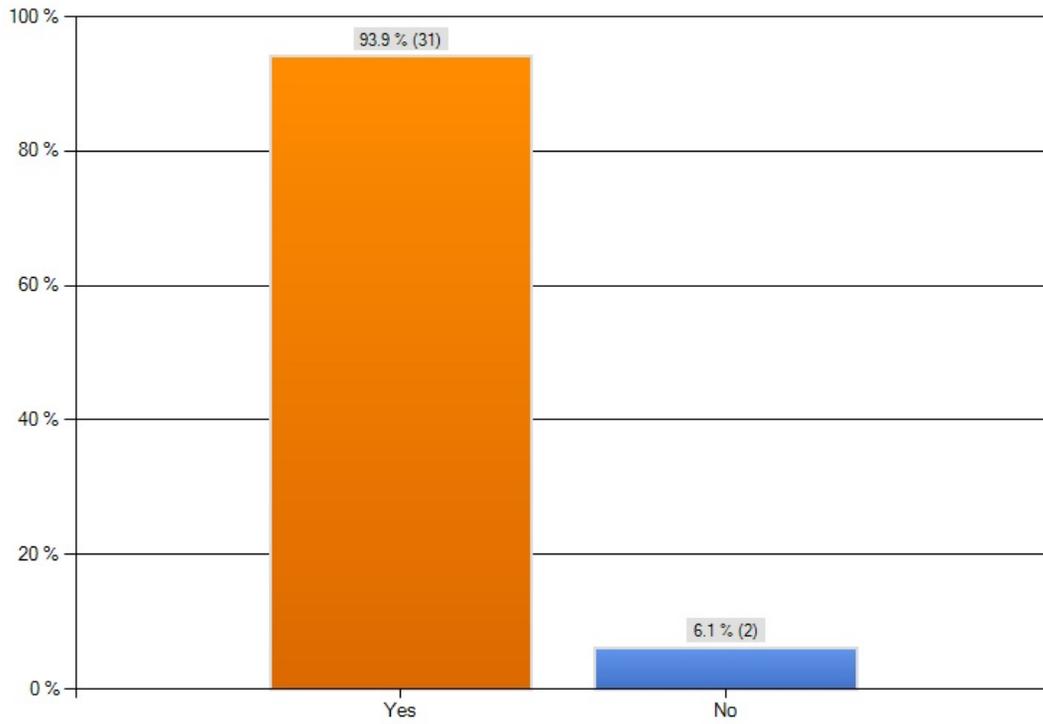
**What is your perception of value to your students of an interactive DNP final project database? (5 being most important to 1 least important)**



7

**Table**

**Would you support having a link on your nursing school website for students to upload their DNP project abstracts upon graduation?**



**Table**

