

## **ACCESSIBLE PRE-LICENSURE NURSING SCHOOL INFORMATION: A QUALITY IMPROVEMENT PROJECT USING KNOWLEDGE TO ACTION FRAMEWORK**

INFORMACIÓN DE LA ESCUELA DE ENFERMERÍA DE PRE-LICENCIATURA PREVIO ACCESIBLE: UN CALIDAD PROYECTO DE MEJORA UTILIZANDO CONOCIMIENTOS AL MARCO DE ACCIÓN

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### **RESUMEN**

En respuesta a la escasez de enfermería proyectada, legisladores de la Florida hicieron modificaciones a la ley de 2009 que cambió la Junta de enfermería aprobación y control de proceso para los programas de Educación de enfermería. Como resultado, el número de programas de enfermería aprobado en la Florida aumento de 171 a 350 (105%), que dio lugar a la proliferación de programas de enfermería pobres con baja graduación y bajo porcentaje de aprobación del NCLEX. Los estudiantes tienen el reto de distinguir programas de enfermería de buena reputación comparada a las instituciones problemáticas. La finalidad de este proyecto era crear una plataforma centralizada basada en web y evaluar la capacidad de la plataforma para incrementar el conocimiento en estudiantes de programas de enfermería posibles, en cuanto a programas de enfermería creíble. El proyecto fue implementado usando el conocimiento para la acción de marco de trabajo. Para probar el aumento de eficacia y conocimiento, estudiantes de enfermería potenciales de veintisiete acordaron examinar todos los componentes de la Página Web. Basado en el análisis, el post cuestionario partituras general fueron superiores a puntajes del cuestionario previo que demostró un aumento en el conocimiento. En el futuro, el proyecto podría ampliarse para incluir clases en línea gratuitas como terminología médica, error médico y mantenerse saludable a través de la escuela de enfermería.

**Palabras clave:** Programa basado en la web, programas de enfermería, escuelas propietarias, programa basado en internet, estudiantes de enfermería potenciales, conocimientos y eficacia.

## ABSTRACT

In response to the projected nursing shortage, Florida law makers made modifications to the law in 2009 that changed the Board of Nursing's approval and monitoring process for nursing education programs. As a result, the number of approved nursing programs in Florida increased from 171 to 350 (105%) which resulted in the proliferation of poor nursing programs with low graduation and NCLEX pass rates. Prospective students are challenged to distinguish reputable nursing programs from problematic institutions. The purpose of this project was to create a centralized web-based platform and evaluate the ability of the platform to increase knowledge in prospective nursing students, regarding credible nursing programs. The project was implemented using the Knowledge to Action Frame Work. To test the effectiveness and knowledge gain, twenty seven prospective nursing students agreed to examine all components of the website. Based on the analysis, post questionnaire scores were overall higher than pre-questionnaire scores which showed an increase in knowledge. In the future, the project could expand to include free online classes such as, medical terminology, medical error, and staying healthy through nursing school.

**Key words:** Web-based program, nursing programs, proprietary schools, internet-based program, prospective nursing students, knowledge, and effectiveness.

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## INTRODUCTION

According to the Health Resources and Services Administration<sup>1</sup>, the growth of the nursing force is expected to exceed the demand in 2030 of approximately 293, 800. This is a striking contrast to the American Association of College of Nursing [AACN] in 2014, where they projected that the U.S. nursing profession will require 1.5 million nurses by 2022, due to the growing need and replacement of nurses<sup>2</sup>. The change from nursing shortage to exceeding the demand is a result of the increase in nursing programs in the United States<sup>1</sup>. According to Geiger & Heller<sup>3</sup>, the cost for higher education in the United States has

increased greatly, outpacing the inflation rate. The cost for nursing programs in the US is approximately \$35,000 to \$140,000 which is based on the type of program, if the program is in or out of state, and whether the student is boarding or not<sup>4</sup>. Low retention rates and attrition costs the federal government approximately 3 million additional dollars annually<sup>5</sup>. For this reason, choosing the appropriate nursing program is important. Currently there are 4,828 accredited nursing programs nationwide, each with their own website that prospective students need to navigate and understand<sup>6</sup>. Given the complexity of academic requirements and

the vast amount of programs to choose from, investigating these nursing school's websites may be a daunting task for prospective and pre-licensure candidates<sup>7</sup>. Prospective nursing students are individuals considering nursing school in the near future and or in the process of completing their prerequisites for a nursing program<sup>8</sup>.

In 2010, the Florida Center of Nursing (FCN) reported that Florida is to expect to see the impact of the nation's nursing shortage by 2025 which would result in the need for approximately 56,000 registered nurses and 12,500 licensed practical nurses<sup>9</sup>. This projected nursing shortage in Florida was based on the nursing vacancies, rate of nurses retiring from the profession, Baby Boomers with age related diseases and low workforce replacement of nurses that will place a high demand for nurses<sup>9</sup>. In response to the projected nursing shortage, Florida law makers made modifications to the law in 2009, on how the Board of Nursing approved and monitored nursing education programs<sup>10</sup>. One major change was the supervision authority which was removed from the Board of Nursing to the Commission of Independent Education<sup>10</sup>. As a result, the number of approved nursing programs in Florida increased from 171 to 350, a 105% increase since 2009<sup>10</sup>. In the FCN's 2018 annual report, they showed the nursing workforce has grown about 7.4% from 2014 – 2015<sup>11</sup>. While it is evident that the nursing workforce in Florida has increased, it is important to make known the vast amount of pre-licensure nursing students who did not

complete their course of study or pass the NCLEX because of poor nursing programs<sup>10</sup>.

Currently, approximately 494 degree-granting higher educational institutions operate in Florida, with 421 for-profit, 28 state community colleges, 33 private not-for profit colleges/universities, and 12 state universities; proprietary schools (i.e., for-profit) account for approximately 85% of the state's higher educational institutions<sup>12</sup>. Of the 421 proprietary schools, approximately 75% (316) offer nursing programs<sup>12</sup>. Because of the number of nursing schools, there is high competition between schools to attract students. Competitive strategies include offering free laptops, shorter time to complete programs, minimal entry requirements, and the promise of a marketable career that will yield a five figure salary yearly. These marketing strategies attract prospective nursing students, of which many have not investigated the nursing program and may not have the academic strength, which can result in students' inability to graduate or pass the NCLEX. These students may also accumulate sizable school loans without the promised nursing income<sup>13, 14</sup>. This is problematic for two reasons: it goes against the ethical principles that govern the profession of nursing, and tax payers are negatively affected when there is misuse of awarded loans that were intended to increase nursing workforce.

In order to address the need of knowledge deficit among prospective nursing students, a web-based

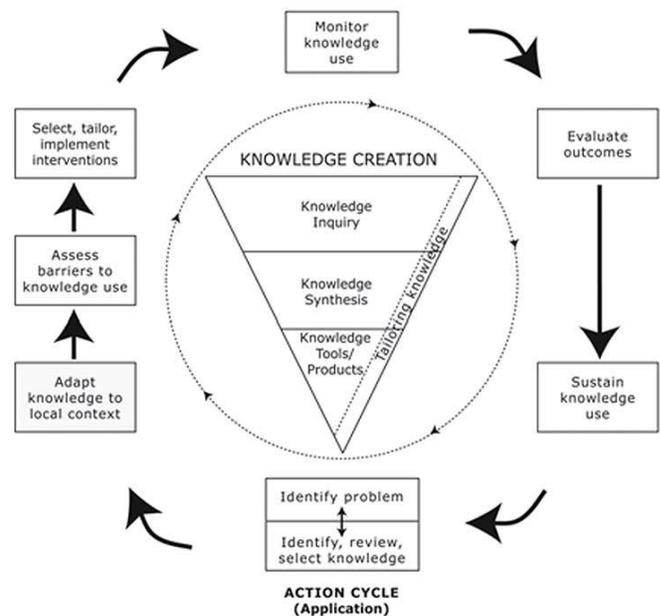
information platform was developed. In today's era where the internet is widely used as the main source of information, this web-based platform is expected to increase knowledge in the participants<sup>15</sup>. Support for this educational platform is evident by the fact that approximately 80% of Americans between ages 15 and 64 years have access and use of the internet, which makes the use of a web-based platform the most reliable way to educate prospective and pre-licensure nursing students in program selection<sup>15</sup>. Thus, the purpose of this project was to create a centralized web-based platform and evaluate the ability of a platform to increase knowledge in prospective nursing students regarding credible nursing programs. The project was implemented using the Knowledge to Action Frame Work.

**METHOD**

**Quality Improvement (QI) Project Process: KTA Framework**

The Knowledge To Action (KTA) framework was used to implement the project among prospective and pre-licensure nursing students using a web-based platform. The KTA framework was created by Graham and colleagues in the 2000s<sup>16</sup>. The KTA framework is divided into two cycles, the knowledge creation cycle and the action cycle<sup>16</sup>. The knowledge creation cycle consists of three phases; knowledge inquiry, knowledge synthesis, and knowledge tools / production<sup>16</sup>. The action cycle consists of seven phases: Identify the problem, adopt knowledge to local

content, assess barriers to knowledge, select tailor implementation intervention, monitor knowledge use, evaluate outcomes and sustain knowledge use<sup>16</sup>. One of the beneficial aspects of the KTA framework is that it can be used by both researchers and clinicians<sup>16</sup>. The first cycle of the framework, knowledge creation, is where inquiry and primary research is conducted<sup>16</sup>. As knowledge is created, new tools are designed to present the new knowledge in a format that the end user can apply<sup>16</sup>. After the development of the tools, then there is the action cycle phase. This project will utilize the knowledge creation cycle and the action cycle, excluding the "monitor knowledge use" phase to implement the QI project.



**Figure 1.** *The Knowledge to action cycle. From Graham, Tetroe, & the KT Theories Research Group (2007). Some theoretical underpinnings of knowledge translation. Academic Emergency Medicine, 14(11), 936-941.*

## Knowledge Creation: Building the Website

The content on the website was designed and formulated by the project manager; the color, pictures, and the web design were completed by a web designer (Figure 2). During the formulation of the content, four website components were found to be essential: 1) appropriate web domain (web address) and web-site title, 2) useful characteristics for web-users, 3) informative nature of the web-site, and 4) of web-based information. According to Heng<sup>17</sup>, a web domain or web address is equally important as the content that is on the web page and should reflect the content of the web page; for this reason, the web domain /address for the project is “nursing-Ed.org”. In addition to creating the web domain, a title for the web-site, “Nursing Education Awareness”, was created through the guidance of the goal and objectives of the project. The title “Nursing Education Awareness” was chosen because the aim is to educate both prospective and pre-licensure nursing students and nurses. Characteristics of web-users were considered in the design of the web-site. According to Crowder & Crowder and Tang<sup>18,19</sup>, pictures, colors, and audio play a role in the length of time web users stay on the page and the chances of a web user to revisit a web site. For this reason, pictures were included on the web site with a pleasant color scheme with contrasting colors used to highlight website elements. Coordinating colors were also used to ensure that the website appeared professional and cohesive. Crowder & Crowder<sup>18</sup> says that a successful web site

is one that fulfills the need of its visitors to include accurate information and at the same time ensuring easy access to website information.

The information on the website was obtained through a rigorous search. In addition to reviewing the literature, reputable nursing organization web sites such as the National League of Nursing (NLN), Florida Nursing Association (FNA), Nursing Consortium of Florida (NCF), American Nursing Association (ANA), and Florida Board of Nursing (FBN) were visited for ideas that provided website content and links that were imbedded within appropriate tabs or pages of the site. In addition to researching professional organizations, government websites were also viewed and information verified through telephone calls. The information was then categorized and placed on the website in eight major tabs which have internal links (tabs linking together from different pages within the web-site): Home Page, Choosing a Nursing Program, Prospective Students, Nurse, Student, Scholarship / Funding, Nursing Agencies, Obtain Certificate, and About Us. The *Home Page* gives a summary of the website’s purpose. The *Choosing a Nursing Program* tab has a sub tab *Questions to ask recruiters* that has information on questions to ask recruiters prior to registering for a program. The primary project manager synthesizes the information and incorporates it on the website. Under the *Students* tab, there are interlink tabs, *Nursing Agencies*, *Paying for Nursing School and Nursing Educational track* containing information

on the educational ladder in nursing, scholarship and funding of nursing education and names of reputable nursing agencies along with hyperlinks. The *Students Tab* contains information on scholarship /funding opportunities (internal links) and in the future will contain YouTube links on challenging concepts for nursing students, medical terminology. The *Nursing Scholarship/Funding* tab contains information regarding funding nursing education and link to organizations that offer funding. The *Nursing Agencies* tab has links to recognized nursing agencies such as the National League of Nursing (NLN), Florida Nursing Association (FNA), Nursing Consortium of Florida (NCF), American Nursing Association (ANA), and Florida Board of Nursing (FBON). The *Certificate* tab gives users the opportunity to take a 15-item test based on the website’s information. This certificate can be used by organizations

that are funding nursing students and will provide evidence of self-directed knowledge about nursing programs. The *About Us* tab gives the mission, goal, and objectives of the project along with contact information.

**Action Cycle: Identify the Problem**

Identifying the problem is the first phase of the Action Cycle<sup>16</sup>. The problem is that there are many nursing schools in Florida, some without credible rigorous programs. Due to a vast amount of programs available, it becomes challenging when gathering information on reputable ones. While there are vast amounts of information all over the internet regarding the nursing programs, very little websites have all the vital information in one place that can be beneficial to individuals who are interested in obtaining information regarding credible nursing programs.



HOME



**Figure 2.** Picture of the home page of the website. www.nursing-ed.org.

**Action Cycle: Adapt the knowledge to Local Context**

While the project manager, who is a nurse educator, and an experienced web designer created the platform, two PhD prepared experienced nursing faculties who were councilors on the project, evaluated and screened the website and its content over a one year period. In addition to the faculties, approximately 20 nursing DNP students gave feedback on the website. Along with the feedback from the professional nursing community, the website was presented at a high school. The information was shared with approximately 57 individuals of whom 55 were high school students in the health related program and two were nursing instructors. The website and its content were shared at a conference hosted by Nursing Consortium of South Florida with approximately 200 attendees. The process of creating the website was rigorous. The feedback and information received were used to enhance applicability of the website so that it was beneficial to the end-users.

**Action Cycle: Assess barriers to knowledge use**

Prior to the implementation of the project, the barriers were evaluated from a structural, process, and outcome level perspective. The structural level refers to organizations barriers, the process level looks at the project manager's barriers, and the outcome levels look at the prospective nursing students' barriers<sup>20</sup>. At the structural level, organizations such as hospitals, schools and other stakeholders may lack

familiarity and knowledge of the website which may interfere with them encouraging their staff to use and access the website<sup>20</sup>. In regards to the process level, the project manager is familiar with the project and has knowledge about the issue which may cause biases<sup>20</sup>. From the outcome level's stand point, prospective nursing students may lack the knowledge, motivation and self-efficacy; they may not have the knowledge of the website and if they do, they may not feel motivated to navigate it<sup>20</sup>. In addition, they may not believe that they can accomplish the dream of getting accepted and graduating from a nursing program.

After the implementation of the project, the barrier that was mostly observed, was from the structural level; the lack of cooperation by organizations to support the website and aid in dissemination of information regarding the website. One of the two the high schools with healthcare academy programs that was approached, declined the offer to share information about the website and its content. The manager reported that they had already incorporated the information in their lecture. Of the two high schools, one accepted the offer and invited the project manager to share the website and the content of the website with their students. One hospital reported that their policy did not allow outsiders to speak to their employees. The barriers were overcome through strategies that included educating the public on the benefit of the website tool while highlighting the cost and benefit through community, legislative, and professional organization forums.

**Action Cycle: Select, tailor implement**

**Participants:** A convenience sample was used to recruit participants. To be eligible, participants must have an interest in applying, have already applied to a nursing program and or enrolled in pre nursing courses, or know someone who is interested in enrolling in a nursing program. Individuals were excluded if they were already nurses. Participants that were not technologically savvy or have no way to access the internet were excluded from the project. Participants were able to access the website from any location with internet availability. Therefore, the intervention took place at a time and location convenient to the participants using laptops, desktops, tablets, smartphones or any other electronic device with internet capability.

Thirty prospective candidates were invited to participate in person, telephone, and email. Of the 30 participants invited, twenty seven were eligible and the 27 accepted the invitation. All participants were provided with full information regarding the aim of the project. The participants were informed that participating in the project was voluntary and that they were free to withdraw from the project at any time. Participants were informed that by not enrolling or withdrawing from the project would not affect their admission to any nursing program. Gift cards of \$10 were awarded to individuals who completed all the phases of the project. The project plan was submitted to IRB and was deemed exempt from review.

**Intervention:** Participants who met the criteria were asked to complete a

pre-questionnaire which is the first phase. After completing the pre-questionnaire, they were emailed the link of the website and given instructions to navigate the web-site; this was the second phase. Participants were asked to review the content on “Nursing Profession”, “Educational Ladder”, “Nursing Organizations”, “Funding Opportunities”, “Career Possibilities”, and “Characteristics of Reputable Nursing programs” on the website. Upon completion of the second phase, the participants were given the link through email to complete the post-questionnaire, the third and final phase. Information was collected on participants’ knowledge on nursing profession, educational ladder, nursing organizations, funding opportunities, career possibilities, and characteristics of reputable nursing programs.

**Action Cycle: Evaluate outcomes**

To measure the knowledge gained from the website, an 11 question measure was created for this project and used for the pre and post-questionnaire. Each question used true and false response options. Examples of questions that were included in pre and post-questionnaire include “Financial aid is the main source of funding education”, “Reputable nursing programs offer incentives for registering for the program”, and “It takes two years to complete a bachelorette nursing program.” The question measure was developed based on the aim of the project.

**Data analysis:** A parametric statistical analysis, including descriptive statistics and paired sample t test were used to evaluate the data. The analyses were done using the IBM ® SPSS ® Statistics 24 version software. Summary statistics, including the computation of means, standard deviations, and percentage were performed. Demographic characteristics of the participants include, educational level, gender, and age. The significance level was set at 0.05.

## RESULTS

Of the 27 participants who accepted the invitation, 81% were prospective and pre-licensure nursing students and 19 % knew someone who was interested in becoming a nurse. The educational level of participants with an associate in arts or science was 38%, high school diploma, 29%, other types of diploma, 19%, and other (Certified nursing and home health aide) 14%. Eighty nine percent of the participants were female and 11% male with an average age of 40.

Based on the analysis, post questionnaire scores were overall higher than pre-questionnaire scores (Table 1). Three questions can be discussed that exemplifies knowledge gain. In the pre-

questionnaire, 52% of the participants understood that a reported NCLEX pass questionnaire, 52% of the participants understood that a reported NCLEX pass rate of 100% is not reflective of students' program exit exam pass rate, while the post-test found the understanding increased to 72%. Another question that exemplified knowledge gain was knowledge on being eligible to take the NCLEX (pre = 81%; post = 95%). Prior to reviewing the website, 85% of the participants knew that federal loans needed to be repaid, and after the website review, 100% of the participants were aware of loan repayment criteria. In one of the questions, the post score was lower than the pre score. The low score could be attributed to multiple factors such as mistyped or guessing; despite this, there was an overall improvement of scores on the posttest.

The mean average score for the pretest and posttest is 83 (SD=12.41) and 92.45 (SD=6.86) respectively (Table 2). The paired difference mean is -9.45 (SD=8.74) which is due to the small sample size (Table3). The data showed statistical significant difference (p.005) between the scores on the pre and the posttest (Table 4). Thus, the low *p*-value (p 0.005) requires the rejection of the null hypothesis.

## Investigación

**Table 1.** Comparison Pretest and Posttest Score of Individual Questions and answers with Low Pretest Scores.

Question	Percent Correct	Percent Correct
	On Pretest N=27	On Posttest N=21
A GED or high school diploma is not a requirement for a nursing program.	100%	90%
To obtain an associate degree in nursing will take approximately two years.	93%	95%
A student is qualified to take the NCLEX if they attend a nursing school that is not approved by the board of nursing.	81%	95%
A promise to decrease tuition cost if recommending a friend makes a nursing program credible.	89%	100%
Course credit earned at any school can be transferred to any nursing programs.	89%	95%
The NCLEX is an examination administered by a nursing school.	85%	95%
Exit exam is a predictor that evaluates students' chances of being successful in the NCLEX.	85%	90%
School's catalog has the grading policy.	73%	86%
Federal loans are money borrowed to pay for education that is required to be paid back.	85%	100%
Nursing programs pass rates can be compared, easily, by using the Florida Board of Nursing web-site.	81%	95%
A school that has a 100% NCLEX pass rate means that every student in the program passed their exit exam.	52%	76%

**Table 2.** Descriptive statistics.

	Mean	N	Std Deviation	Std, Error Mean
Pretest	83	11	12.41	3.74
Posttest	92.45	11	6.86	2.07

**Table 3.** Paired Difference Descriptive statistics.

	Mean	Std Deviation	Std, Error Mean	95% Confidence Lower
Pretest - Posttest	-9.45	8.74	12.41	-15.33

**Table 4.** Paired Sample t-test.

	Paired 95% confidence Interval of the Upper	T	df	Sig (2 Tailed)
Pretest - Posttest	-3.579	-3.586	10	0.005

**DISCUSSION**

**Action cycle: Sustain knowledge use**

Finally, “sustaining knowledge use” is critical to a program’s success and is defined by the ability or capacity of the project to maintain or to sustain itself and is important to any project after the effectiveness has been identified<sup>16</sup>. To sustain the web-based project, organizations such as hospitals that offer education reimbursement and CareerSource (i.e., a government agency that assists low income individuals with seeking jobs and funding for school), were invited to participate by requiring their eligible candidates to use the web-site as a tool to educate themselves regarding reputable nursing schools and funding/scholarship opportunities. In addition, continuing education will be added as a resource for both nursing students and nurses which will increase the traffic on the website. Professional social network such as LinkedIn will have information on the benefits of the website which will attract visits and users. Professional organizations such as Florida Center of Nursing, Florida Nursing Association, and Nursing Consortium were invited to collaborate and disseminate the information about the website.

**Summary**

This project revealed significant gaps in the knowledge of prospective nursing students. The website has the potential to increase awareness in prospective nursing students and the public regarding understanding of the educational ladder for the nursing profession, identifying characteristics of reputable nursing programs, increase awareness regarding funding and scholarship opportunities and identifying reputable nursing organizations. The accessibility of the information by the internet using phones, tablets, and computers, makes it ideal for providing easy access to information. While making information accessible is vital to this project, there is a more pressing issue, the proliferation of poorly performing programs in Florida. It is evident that it will take a multifaceted approach to rectify this issue, with change in nursing education policy being the initial force.

**Limitations**

A few project limitations were found. First, this was not a randomly selected sample of prospective and pre-licensure nursing students and the sample of participants was small which resulted in a high standard deviation. Twenty

seven completed the pre-questionnaire and 21 completed all three phases (pretest, intervention, and posttest). Using the same questions for the pre-questionnaire and post questionnaire can lead to recall bias. The attempt to minimize this was done through withholding correct answers and not giving the link to the website until the pretest was completed. In addition, long-term knowledge retention and change in behavior was not determined because this project measured only short-term increase in knowledge. Moreover, internal validity and reliability of the pre and post questionnaires were not performed in the project; but, the knowledge gaps that were identified are similar to what is found in the literature and provides a measure of external validity to the test questions as a group.

### **Implication for practice**

The findings from this project have important implications for both nursing education and clinical practice. Application to credible nursing programs can be affected (increase) while application to nursing programs with poor curriculum and poor standard may decrease. The website educates the public, especially prospective pre-licensure nursing students with knowledge gap as it relates to reputable nursing programs and other issues. With prospective nursing students educated on issues that affect their education, students will be more committed and more likely to attend nursing programs that are reputable<sup>21</sup>. The website provides an

evidence based way of increasing knowledge regarding credible nursing program, substantively shifting the authority from the nursing schools owners to the public, particularly prospective nursing students.

Law makers in Florida are seeking ways to increase the nursing work force to meet the challenge of the rapidly evolving health care system. With both graduation and NCLEX pass rates increasing, the impact of the nursing shortage will continue to decrease. While using the internet is not the only way to educate the public, it is one of the most effective. The influx of nursing programs in Florida was a result of changes in the law through the legislative process. Therefore, to ensure that only reputable programs with rigor are able to accept students, nurses and other stakeholders should get involved in the political process.

Findings from this project offer evidence supporting the use of a web-based tool to increase public knowledge regarding credible nursing programs. The evidence suggests that education is needed to assist prospective students in choosing credible nursing programs. Educating the public is not only beneficial for prospective students, but also for tax payers, academia, users of the health care system and other stakeholders as evidenced by increasing retention in nursing programs, increase nursing workforce, and prudent use of tax payers money with the prospect of repaying loans.

## CONCLUSION

The need for educating pre-licensure students is vital because it is linked to graduation and NCLEX pass rates which can impact the nation's nursing work force. Therefore, the web based tool is the instrument of choice that has the potential of reaching thousands of pre-licensure nursing students in Florida, and educating them on how to select reputable nursing schools which will ensure quality education and increase graduation rate and NCLEX pass rate.

It is a projected goal that agencies and organizations find this web site helpful with credible information to pre-licensure students. Funding agencies and organizations will be encouraged to recommend the use of this website to ensure that pre-licensure nursing candidates research nursing programs prior to receiving funding dollars. Evidence from the literature was used to create the website which will be monitored in the future, using web-watch or web analysis software to verify how many people visited the website and the amount of time they stayed on. In the future, the project could expand to include free online classes such as, medical terminology, medical error, and staying healthy through nursing school. Ultimately, the use of this website will limit the number of poorly informed students (i.e., ones that do not understand the pitfalls of poor nursing programs) which will increase the academic and professional success of knowledgeable nursing students.

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