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*University of Texas at Tyler*

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Implementation of An Electronic Clinical Placement System for Improving Faculty  
Workflow and Accreditation Compliance

by

JANICE MCCLAREN HAWES, MSN, RNC-OB, CNS

A DNP Final Report submitted in partial fulfillment  
Of the requirements for the degree of  
Doctor of Nursing Practice  
School of Nursing

The University of Texas at Tyler  
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The University of Texas at Tyler  
Tyler, Texas

This is to certify that the Doctoral Scholarly Project Report of

Janice McClaren Hawes

has been approved for the final project requirement on

August 2, 2022

for the Doctor of Nursing Practice degree

Approvals:

DocuSigned by:  
*Cheryl D. Parker, PhD, RN-BC*  
880E85CC4E4E4  
Faculty Mentor Cheryl D. Parker, PhD, RN-BC

DocuSigned by:  
*Brenda Burton*  
890C007AC7D492  
Industry Mentor Brenda Burton

DocuSigned by:  
*Gloria Duke*  
3A95258288E49C  
Committee Member Gloria Duke

DocuSigned by:  
*Lauri D. Johns, PhD, RN, CNS*  
054003C98FB3412  
DNP Program Director

DocuSigned by:  
*Jennifer Clifton*  
Associate Dean for Academic Affairs, School of Nursing

DocuSigned by:  
*Barbara Hawes*  
985A922F38F54C7  
Dean, School of Nursing

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## **Abstract**

Healthcare today is continually evolving and requires healthcare providers to coordinate and work together to provide quality care. Among healthcare changes is the increasing expansion of technological improvements assisting in mainstreaming processes. In the academic setting, these changes are currently needed to help improve faculty workflow and assist in regulatory compliance. The purpose of this paper is to discover if implementing technology in a clinical nursing setting through an evidence-based practice approach will improve nursing faculty workload and aid in accreditation compliance. The design and methodology for this project were developed using the Iowa model of evidence-based practice, the Donabedian model of examining health services and healthcare quality, and Roger's five-stage change theory.

Based on the evidence and the program outcomes, the project revealed that by applying technology in a clinical setting, faculty workflow could produce improvements and further assist in increasing regulatory compliance.

## **Chapter 1 Development of the Clinical Question and Problem Identification**

Today's healthcare continues to evolve and requires providers to coordinate and work together to provide quality care. Among healthcare changes is the increasing expansion of technological improvements assisting in mainstreaming processes. These changes are currently needed to help improve faculty workflow processes and assist in the Texas State Board of Nurse Examiners' regulatory compliance. With an increasing shortage of registered nurses and nursing faculty, there need to be more creative ways to help overcome extra burdens that create more work. This paper aims to describe and explain an evidence-based practice (EBP) project to determine the outcomes of using a technology-based clinical placement system in an undergraduate fully accredited nursing program.

### **Background and Significance**

The registered nurse (RN) workforce continues to be one of the fastest-growing occupations, and it is projected that 3.3 million RNs will be needed by 2029 (American Association of Colleges of Nursing [AACN], 2020). The current and projected nurse faculty shortage threatens the capacity to educate enough nurses to meet this demand. The AACN (2020) also identified that 87.5% of the nursing programs reported that full-time faculty vacancies were 1,637 in October 2019. Li et al. (2019) found that vacancies were across educational levels and varied across regions, with the Northeast at an 11% vacancy rate, the South at 7.7%, the West at 7.4%, and the Midwest at 6.8%.

Factors that surround the nurse faculty shortage are varied and multifaceted. Issues identified included insufficient nurse educator program funding, an aging nurse educator population, and retention problems (Bittner & Bechtel, 2017; Dalby et al., 2020; Fang & Kesten, 2017; Mazinga, 2020; National League for Nursing [NLN], 2017). Projections are one-third of current nurse faculty will retire in the next ten years, from 2017-2027 (Fang & Kesten, 2017).

Nurse faculty workflow processes are another issue affecting the nurse faculty shortage (Cotter & Clukey, 2019; Duphily, 2011; Logan et al., 2016). Numerous studies find nurse faculty



workload can impact nurse faculty job satisfaction, hindering faculty retention (Arian et al., 2018; Cotter & Clukey, 2019; Lee et al., 2019; Theis & Serratt, 2018; Whestphal et al., 2016; Yedidia et al., 2014). Gentry and Johnson (2019) recommend that efforts be implemented to alleviate the nurse faculty shortage. Whestphal et al. (2016) noted that some universities address educators' needs by employing part-time faculty to fill gaps in teaching assignments. They also highlighted that the disadvantage of part-time faculty is a lack of commitment, and they require frequent training to keep up with changes in technology and pedagogy (Whestphal et al., 2016). Alghamdi (2016) identifies that workload can be influenced by managerial issues such as nurses' satisfaction, turnover, work stress, and productivity.

Suppose job satisfaction and nurse faculty retention are vital to the success of the nurse faculty profession. In that case, an important consideration may be to address nurse faculty workflow processes allowing for a potential increase in efficiency. Information technology has advanced significantly in recent years, especially wireless devices. Technology is designed to automate processes to increase productivity, flexibility, and efficiency (Nes et al., 2020). Could technology implementation in a clinical nursing setting through an evidence-based practice approach help improve nurse faculty workflow processes and increase accreditation compliance?

Technological innovation has rapidly developed healthcare clinical information and communications technology (Lee et al., 2018). Over the past decade, the federal government mandated healthcare providers to implement electronic health records into practice by 2015 (Branstetter et al., 2014). So, it is no surprise that nursing schools have implemented the use of electronic clinical tracking systems (ECTS) in the healthcare education system (Branstetter et al., 2014; Lears et al., 1998; Goldsworthy et al., 2006; Nisbet et al., 2020; Salyers et al., 2013; Smith et al., 2016). These ECTS programs assist in automating clinical placements vs. the traditional paper systems that still exist in most nursing programs today.

As an employee of a progressive university and growing nursing school, the awareness to evaluate processes and systems and the alignment with workflow, productivity, and efficiency is heightened. As technology becomes more of an everyday routine, it requires considering moving from paper to electronic processes. The clinical nursing courses for the University's undergraduate program are still administered in a paper format. The evaluation of this process is needed to determine if systematic improvements in efficiency provide the benefits required in today's busy healthcare clinical environments.

### **Internal Evidence**

The EBP project begins with practice-based evidence and research to determine the need for improved outcomes (Fineout-Overholt & Stevens, 2019). Fineout-Overholt & Stevens (2019) further identifies that internal evidence is generated through practice initiatives, including outcomes management, quality improvement (QI), or evidence-based practice (EBP) projects. Therefore, the generation of internal evidence is intended to improve clinical practice and outcomes within the local setting (Fineout-Overholt & Stevens, 2019).

The University of Texas of Tyler (UT Tyler) is in the state's eastern area, located on Tyler's main campus. It has three additional satellite campuses in Longview, Palestine, and Houston. The School of Nursing (SON) is one of the largest schools at the University and includes two undergraduate and twelve graduate nursing programs. This EBP was presented as a proposal to the leadership team's key stakeholders, including the BSN Program Director, Executive Director, and Dean of the College of Nursing. Working within a shared governance model, the SON strives to empower students to excel as nurse clinicians, leaders, and scholars in a caring, learner-centered, strengths-based environment. The school's vision is to aspire to be the leader in transforming lives through excellence and nursing education. In 2019 the UG program became a year-round program. This change called for more nurse faculty to commit to teaching all three semesters or for the administration to hire more nurse faculty. Locating qualified nurse faculty who want to move into an academic position means that

most will take a decrease in salary. When qualified faculty are not hired to fill those vacant positions, adjunct nurse faculty are hired temporarily. This equates to current nurse faculty taking additional responsibilities since the adjunct nurse faculty are usually not adequately trained or able to fulfill all the clinical placement requirements, as identified in Whestphal et al. (2016). The additional workflow processes required for the full-time nurse faculty increase the need for better processes and systems to reduce nurse faculty workflow processes and increase efficiency.

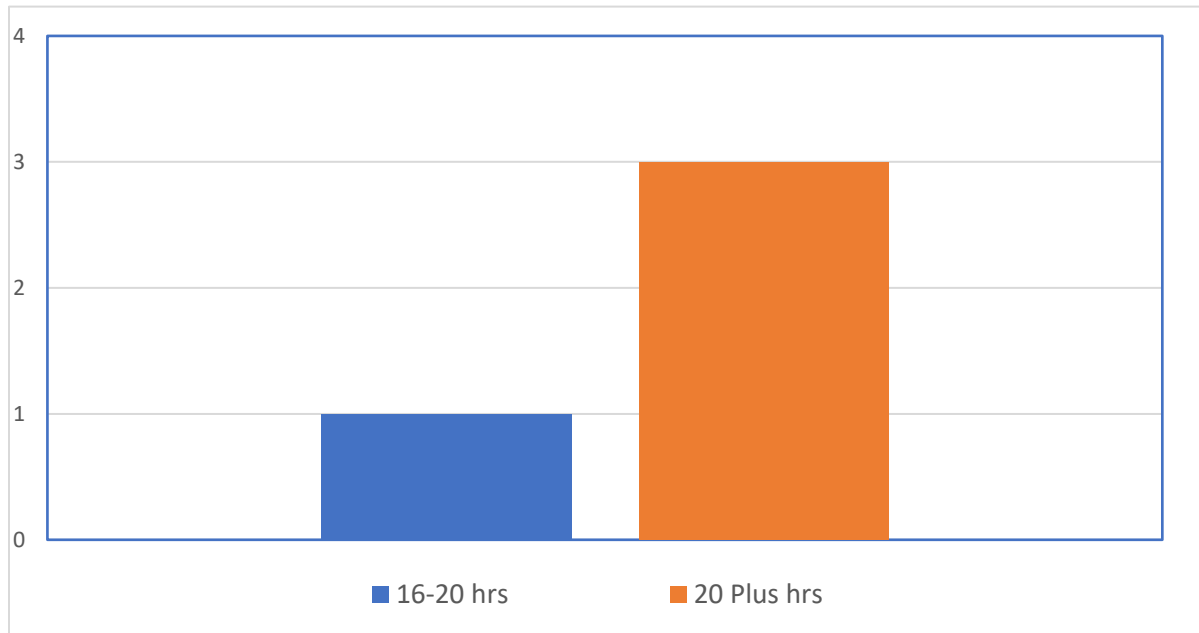
### **Undergraduate Faculty Qualtrics Survey**

A Qualtrics survey was developed to evaluate nurse faculty input regarding current preparation and processes for the NURS 4338 Clinical Immersion course. An email link was sent to the four-lead undergraduate (UG) nurse faculty members who teach the clinical immersion course at UT Tyler. The Qualtrics survey consisted of two questions related to the current process for the clinical immersion course.

The first question focused on the estimated number of hours spent on paper clinical placement processes for each clinical rotation. Each clinical rotation comprises approximately 15 students who work 9 -12-hour shifts with a designated preceptor. This rotation spans about five weeks, and each semester consists of two rotations. All four-nurse faculty responded to the Qualtrics survey providing 100% participation. Three of the four faculty indicated greater than 20 hours per rotation were spent using the paper clinical placement process. In comparison, one faculty showed 16 to 20 hours per rotation, as shown in Figure 1.

**Figure 1**

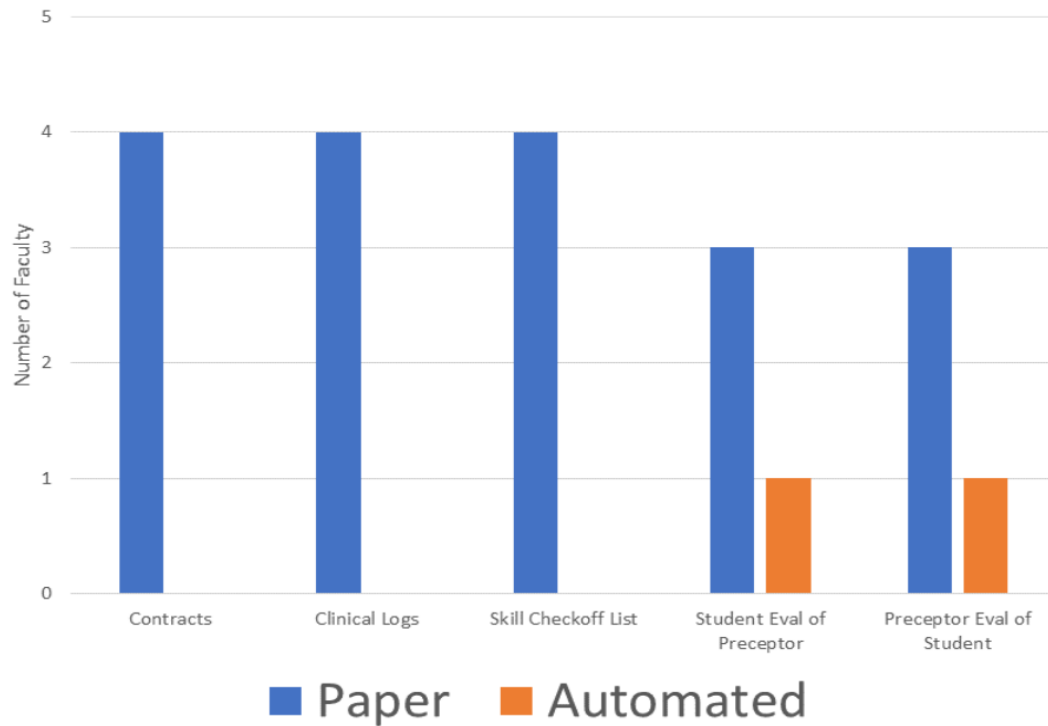
*Clinical Immersion Faculty Qualtrics Survey (Hours)*



The second question was directed at the current required clinical placement paperwork, including preceptor and student evaluations, preceptor agreements, and other documents needed for the clinical immersion course. Three faculty responded affirmatively that paper processes were used on five activities, and one responded that two of those five activities were automated, as shown in Figure 2. The latter finding may be due to the interpretation that it was automated since the two records were sent from the students using screenshots, but the process remains in a paper format. In summary, internal evidence indicated that, as a rule, faculty in the clinical immersion course spend more than forty hours per semester preparing the clinical immersion placements. The clinical placement processes and preceptor-student evaluations remain in paper formats.

**Figure 2**

*Clinical Immersion Faculty Qualtrics Results (Current Paper Processes)*



The UT of Tyler SON currently has an electronic clinical placement system called InPlace designed to assist with clinical placement assignments, preceptor and student evaluations, and other record-keeping functions. The UT Tyler nurse graduate programs are now using automated clinical placement processes to help them reduce their manual workload. Significant challenges prevented the implementation of InPlace for the entire UG program. Identifying the potential benefits of using InPlace for the UG program was believed to be a starting point to moving forward with strategies to overcome challenges and obstacles.

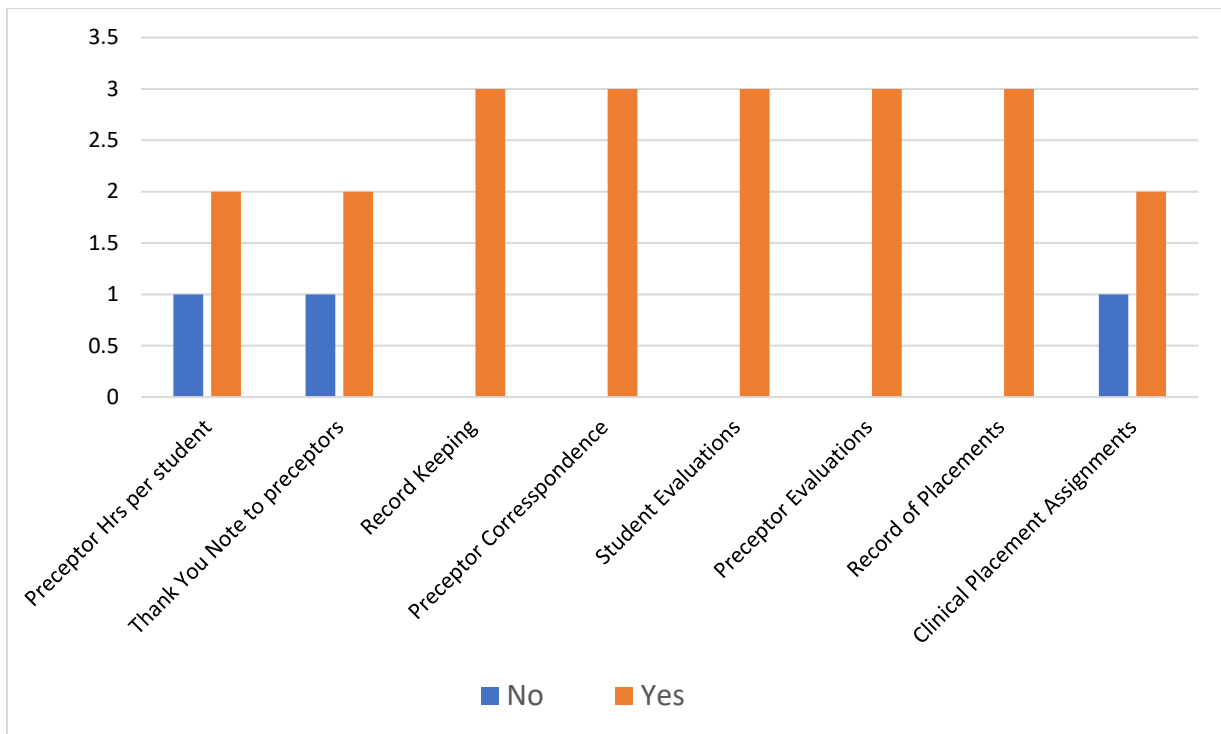
**Family Nurse Practitioner Qualtrics Survey**

A Qualtrics survey was developed and administered to the Family Nurse Practitioner (FNP) faculty for their input and evaluation as current users of the InPlace system. The survey

included two questions: workflow steps reduced and improving processes. Six FNP faculty members received an email with the Qualtrics survey link; three participated, providing a 50% response. Two of the three FNP faculty respondents revealed that the InPlace program's implementation had reduced the steps in the workflow, while one stated it was increased. The second question was to determine the faculty's input to determine if the eight indicators were improved with the InPlace program implementation. Improvement was shown for five indicators, but three had a 66.6% affirmative and 33.3% negative for InPlace improving processes.

**Figure 3**

*FNP Faculty's Impression of Improved Workflow Processes*



## **Accreditation Compliance Considerations**

The second aim of this project was potential process improvement of the impact of automated systems on compliance with the Texas Board of Nursing 3.8.3.a. Education Guideline Precepted Clinical Learning Experiences (Texas Board of Nursing, 2020). The current process involves extracting large numbers of paper files filled with even more paper documents housed in various physical locations. There are several forms in the process that, if converted to a computerized informatics system, could reduce the workflow processes and aid in readily obtaining the required documents for accreditation compliance. These requirements include clinical preceptor competency, current licensure or privilege to practice as a licensed nurse, presence of written agreements, and completion of preceptor orientation (Texas Board of Nursing, 2020).

The internal evidence surveys provide preliminary data for potential benefits of using an automated system, such as InPlace, primarily by having a more streamlined approach to improve nurse faculty efficiency in workflow. Support for this EBP project included the key stakeholder of nursing administration, UG nurse faculty, and two selected hospital facilities as end-users. The following PICOT question was developed to guide the literature search: In undergraduate nurse faculty, would implementing an electronic clinical placement management system vs. a paper-based clinical management system (a) decrease faculty workflow or (b) increase accreditation compliance in one semester? The University has the InPlace system in place for the FNP program. The system has not been developed for the UG program. The goal was to learn how the FNP program used InPlace to assist in creating and implementing the system within the NURS 4338 Clinical Immersion course.

## Chapter 2 Evidence Synthesis and Models: Part 1

### Systematic Search

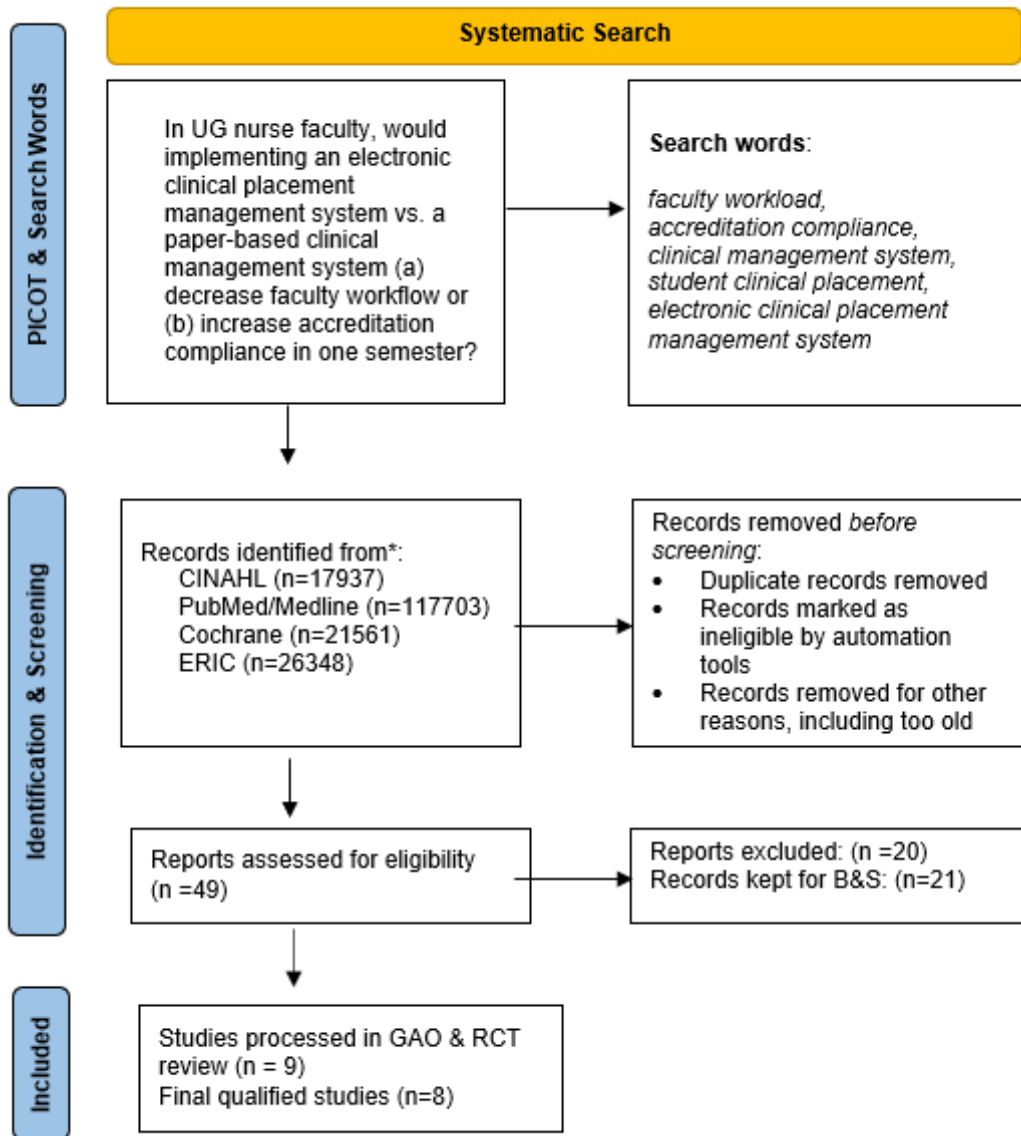
A systematic search was conducted to answer the PICOT question. Keywords from the PICOT questions used in the search across all databases were: *faculty workload, accreditation compliance, clinical management system, student clinical placement, and electronic clinical placement management system*. Subject headings were also systematically searched individually and combined with keywords and like terms to yield the most relevant hits in each database. Inclusion criteria were utilized using *human subjects* and *the English* language. Because the question is educationally focused, the Education Resources Information Center (ERIC) database was searched in addition to the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed/Medline, and Cochrane Library.

In CINAHL, 17,937 total hits were obtained using combined keyword searching. The search needed to be refined to get a reasonable yield, as shown in Appendix A: Figure 1. In PubMed/Medline, 117,703 results were obtained using combined keyword searching. The Cochrane Library yielded 21,561 results. The ERIC database provided 26,348 results using the consistent, systematic search process. The searches from all four databases were reviewed to eliminate duplicates and extraneous articles before processing the keeper studies. Once all four database yields were reviewed, eight keeper studies were retained for critical appraisal. This process is illustrated in Figure 4.



**Figure 4**

*Systematic Search Results*



**Critical Appraisal**

After completing steps zero through two, the next initiated step was three of evidence-based practice, critical appraisal. Step three is one of the most valuable skills needed and a hallmark of EBP (Melnyk & Fineout-Overholt, 2019). Critical appraisal begins with determining

which studies will be retained as keeper studies and then extracting data for them individually. The third and fourth phases of critical appraisal were reflected by evaluating the eight keeper studies and making recommendations from the information gleaned from these evaluation and synthesis tables.

### **Rapid Critical Appraisal**

Rapid critical appraisal (RCA) involves the critical appraisal of previously obtained evidence from the search process (Melnyk & Fineout-Overholt, 2019). Phase one of the RCA was completed to determine if the literature identified was relevant, valid, and applicable to the PICOT. The eight articles presented have each undergone the RCA process using the general appraisal overview format, and each type of level of evidence forms to determine if they met the criteria of keeper studies.

The first keeper study, an RCT level 2, examined the relationships between personal digital assistants (PDA) and self-efficacy. Completing the GAO and RCT validity tools provided more support for technology implementation in the healthcare setting. The second study was a level 4 case study in Form C2, GAO, and RCA and demonstrated this study met validity criteria. This study was determined to be a keeper for the design and planning of the implementation plan.

The remaining six studies included two level 6 and four level 7 lower-level studies evaluated using the GAO and RCA forms. All met validity criteria with their contributions to various technological products, and each was retained for further appraisal.

## **Evaluation**

The second phase extracted the data and placed it into the evaluation table. This step helped organize the articles by the level of evidence, study design and methods, sample size and characteristics, variables, study results, and general information about their worth to this project. The data compilation into one table allowed the ability to dig deeper into each study for the body of evidence used in this study. The table format provided a way to review the data regarding general commonalities, variables, and study findings. Commonalities in this evaluation table allowed for an easy comparison of the various technological tools used and their components. Differences were also recognized in the variation of the outcomes of each study.

## **Synthesis**

The next phase of the RCA after the evaluation table was developing the synthesis tables. The synthesis tables provide the best way to formulate and communicate the essential information to compare across the studies (Melnyk & Fineout-Overholt, 2019). Three synthesis tables were completed using the eight articles identified as the body of evidence (BOE) or keeper studies outlined in the evaluation table.

The first synthesis table identified each study categorized by level of evidence, see Table 1. The BOE for this study consisted of two higher-level and six lower-level pieces of evidence. The level of evidence identified as one level 2 RCT study, one level 4 case-control study, two-level six qualitative studies, and four-level seven were either literature reviews or expert opinions. The continued search was focused on locating higher-level evidence. Still, the search was unsuccessful, revealing that more research needs to be completed on technological implementations in the healthcare setting.

**Table 1***Synthesis Table Level of Evidence*

Level of Evidence	1	2	3	4	5	6	7	8	Total
Level I: Systematic Review/Meta-analysis/integrative review									0
Level II: Single RCT	X								1
Level III: QE studies & non-randomized trials									0
Level IV: Cohort & Case-control studies		X							1
Level V: Systematic Review (meta-synthesis) of QUAL studies (or descriptive studies)									0
Level VI: Single QUAL or DESC studies			X	X					2
Level VII: Expert Opinion					X	X	X	X	4

Legend: Goldsworthy et al., (2006); 2=Nisbet et al., (2020); 3=Salyers et al., (2013); 4=Smith et al., (2016); 5=Branstetter et al., (2014); 6=Lears et al., (1998); 7=Shoaf, (1999); 8=Smart et al., (2020).

The second synthesis table, Table 2, demonstrates the technological impact and the studies' outcomes. This information provided three studies that revealed faculty and nursing student satisfaction and technical benefits. Two studies identified documentation competency ability, and two demonstrated an increased efficiency with technology over manual paper methods.

**Table 2***Outcome Synthesis Table Intervention & Outcome*

Intervention/Outcome	1	2	3	4	5	6	7	8
Self-Efficacy test	✓							
Understanding of problems		✓						
Faculty & NS Satisfaction/beneficial with Tech.			✓		✓			✓
Documentation Competency				✓		✓		
Documentation Efficiency (manual vs. computer)						✓	✓	

Legend: Goldsworthy et al., (2006); 2=Nisbet et al., (2020); 3=Salyers et al., (2013); 4=Smith et al., (2016); 5=Branstetter et al., (2014); 6=Lears et al., (1998); 7=Shoaf, (1999); 8=Smart et al., (2020).

The third synthesis table reviewed the types of technology comparison of components measured as identified in Table 3. This synthesis table noted that six technological tools demonstrated satisfaction or support for the technology. Three revealed improvements in documentation, and four identified an increase in time management, increased efficiency, and

decreased workflow. The last component was compliance with documentation, in which two were identified as positive.

**Table 3**

*Outcome Synthesis Table Technology Comparison of Components*

Technology/Components	1 PDA	2 CHAT	3 NSST	4 ECTS	5 CCRDB	6 SSCAMP	7 General
Paper vs. Technology	X					X	X
Satisfaction or/supports technology	X		X	X	X	X	X
Documentation improved	X						
Time Management							
Efficiency	X			X	X	X	
Workflow Processes							
Compliance			X	X			
Self-efficacy	X						
Help in Design & Planning		X					

Legend: Goldsworthy et al., (2006); 2=Nisbet et al., (2020); 3=Salyers et al., (2013); 4=Smith et al., (2016); 5=Branstetter et al., (2014); 6=Lears et al., (1998); 7=Shoaf, (1999); 8=Smart et al., (2020).  
Types of technology: CCRDB=centralized, computerized, and relational database. CHAT=cultural historical activity theory; ECTS=electronic clinical tracking systems; NSST=Nursing school student tracking; PDA=personal digital assistants; SSCAMP=Student/site computer-assisted matching program.

**Recommendation**

A preliminary recommendation was for computerized systems to be implemented as a better option than paper applications with the expected outcomes for nursing students and faculty satisfaction, increased efficiency, and competency compliance. The external and practice-generated evidence from the initial trial with the LUC clinical immersion course was blended through synthesis to craft a recommendation to support the next steps for implementing a best practice system and expected outcomes.

**EBP Model**

The Iowa Model was selected as the evidence-based practice model to guide the implementation plan. The Iowa model outline provides a pragmatic multiphase change process and guides nurses and other clinicians in making decisions about clinical and administrative practices (Melnyk & Fineout-Overholt, 2019). The flowchart shows decision-making, problem-

solving steps, and feedback loops that guide the change process. It also includes a trial of the practice change before implementation occurred and was designed as an interdisciplinary approach emphasizing use on an organizational level.

### **Change Model**

The change model selected was Rogers' Diffusion of Innovations theory. This change model is most appropriate for investigating technology adoption and a practical, theoretical framework for nursing schools considering integrating technology to enhance learning (Doyle et al., 2014). Doyle et al. (2014) supported the concept that implementing technological changes in an organization can be challenging. Still, evidence-informed strategies like Roger's theory can guide the adoption of new technologies to improve processes. Roger's diffusion of innovation model, first described in 1962, offers that discussion of innovation at the individual level occurs in five stages: 1) knowledge, 2) persuasion, 3) decision, 4) implementation, and 5) confirmation (Doyle et al., 2014). The first is how an individual passes from first knowledge of an innovation to forming an attitude toward the innovation; the second is the persuasion of the change, the third is the decision to adopt or reject, the fourth is implementing the idea, and finally is the confirmation of this decision (Aizstrauta et al., 2015). It is suggested that these stages and characteristics be monitored and recognized when persuading users to adopt an innovation, in this case, technology adoption (Doyle et al., 2014).

### Chapter 3 Project Planning and Methodology

The design and methodology for this project implementation were developed based on the Iowa model and Roger's change theory. A high-level plan was used as an outline using the five phases of a project, as shown in Table 4. The five phases followed the initiate, plan, execute, control, and close project elements for the overall project plan.

**Table 4**

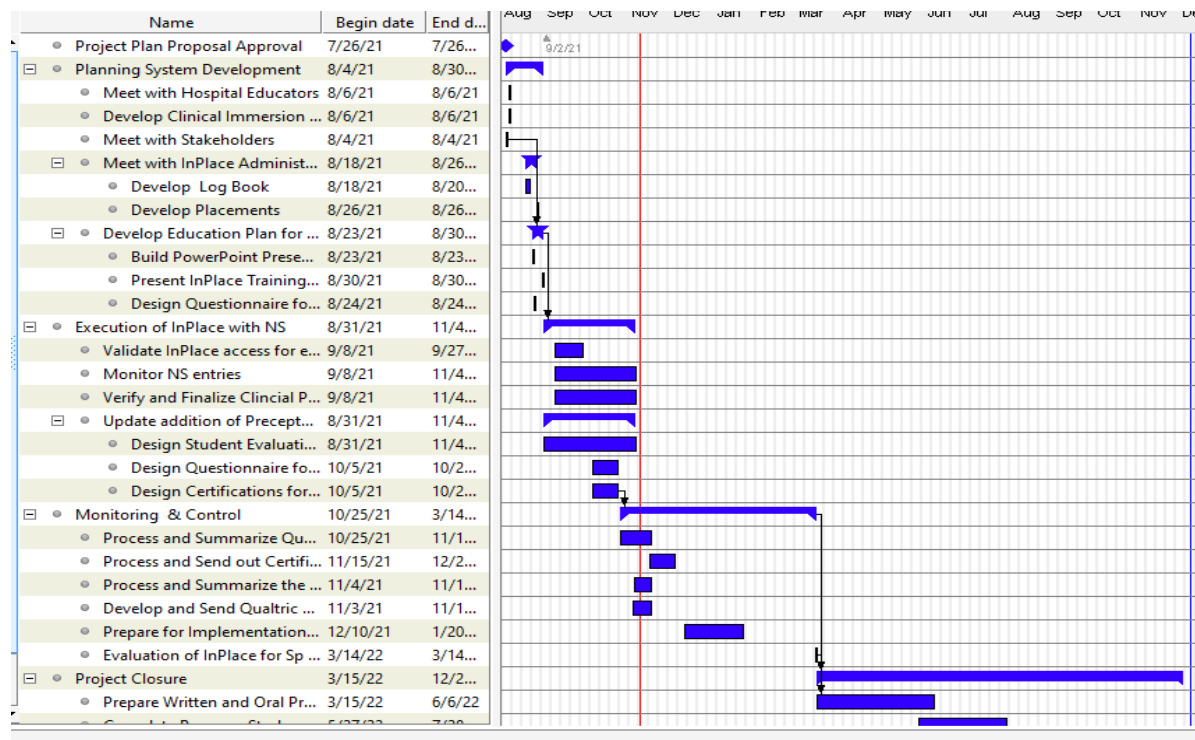
*High-level implementation timeline*

Date	Implementation Item
May 2021	Work on comparison of current workflow vs. InPlace workflow.
June 2021	Begin learning InPlace System and build InPlace components
July 2021	Stakeholder meeting addressing financial implications & risk mitigation.
July 2021	Present to faculty for approval to progress with the implementation plan.
Fall 2021	Continue to design system & develop training material. Implement the initial pilot.
Spring 2022	Evaluate pilot outcomes. Make changes based on the pilot. Determine an additional pilot.
Fall 2022	Evaluate & measure outcomes and work towards sustainability of the project.

An implementation timeline was developed as a general overview of the project using a Gantt chart and was adapted as the project progressed, see Figure 5.

**Figure 5**

*Detailed Timeline using a Gantt Chart*



Presentations and meetings were scheduled in July 2021, after the InPlace system was explored and further developed for approval of the initial pilot implementation. Upon receiving permission to proceed, the pilot was implemented at UT Tyler SON on the Longview campus involving fourth-level nursing students. These students were enrolled in the clinical immersion course and agreed to participate in this project. The Institutional Review Board approval was not required for this project. The population for the EBP project focused on healthcare personnel, including nurse faculty, nursing students, and hospital staff. Even though this project did not directly impact the patient, the nurses can have a ripple effect on their patients regarding overall satisfaction and efficiency measures, affecting the quality of care.

### Fully Operationalized Plan

The initial pilot included nursing students and their assigned preceptors from the clinical immersion course at UT Tyler on the Longview campus. The first cohort included 14 level four

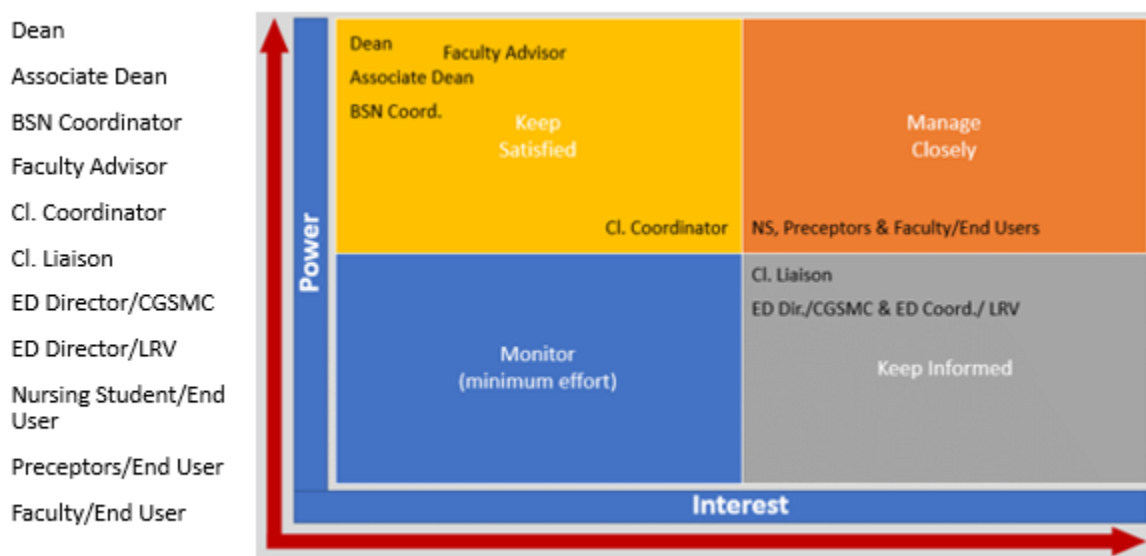


students enrolled in the course. The subsequent implementation phase was planned for Spring 2022 in the same course and with 15 nursing students that meet the same criteria of being level four students enrolled in the clinical immersion course on the Longview campus. As identified in the Gantt chart (see Figure 5), the project planning phase had previously included meetings with key stakeholders and the development of the InPlace system components.

Since stakeholders play a significant role in the success or failure of a project, a Stakeholder Power Interest Grid was developed. Figure 6 outlines and identifies their roles and potential power/interest in the effects of this project. The UT Tyler Administrative team has the highest power and requires higher satisfaction. This process was accomplished by presenting the UT Tyler Administrative team with updates throughout each project step to keep them informed of the project phases. The nursing students, preceptors, and nurse faculty needed to be closely monitored for their feedback. They were the end-users, and their success or failure in the ongoing implementation was critical. The clinical liaison and educators are external participants with medium power; therefore, keeping them updated on the project was essential.

**Figure 6**

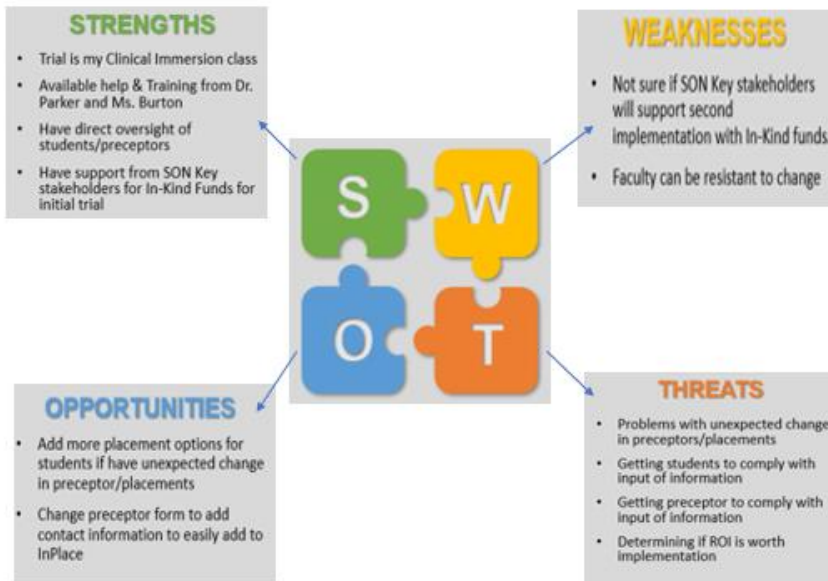
*Stakeholder Power Interest Grid*



Another process used in planning was the project's strengths, weaknesses, opportunities, and threats. Those items are identified in the SWOT analysis in Figure 7.

**Figure 7**

*SWOT Analysis for EBP Project*



The strengths identified included the author being the clinical nurse faculty instructor for the course. Strengths also included the access and availability of the InPlace administrators and support from the SON key stakeholders. A weakness was the unknown availability of in-kind funding for the second implementation phase. Funding will determine if the second implementation phase can be implemented. Opportunities included editing and changing the InPlace system and adding features for the project to be more successful. Threats identified included unexpected changes in preceptors and placements, students, and compliance, and determining the return on investment's worth for the final implementation of this project. Additional aspects completed included risk identification and analysis, risk mitigation, and risk response planning, as reflected in the Risk Analysis matrix in Figure 8, with eight risks associated with the plan's implementation. The risk scores ranged from five to eight, ranking risk low, medium, and high. The two highest-risk issues identified included the need for in-kind

funding for the project and nursing students not completing the InPlace project according to the plan. These risks were key factors for the success of this pilot. The risk management methodology was to alleviate with an early presentation to the SON administrators for the needed funding, which was obtained. The student's participation with the InPlace system was materialized by providing the students with training and monitoring by the nurse faculty throughout the implementation of this pilot. These risk mitigation steps provided the evaluation and effectiveness of overcoming the risk for successful project implementation.

**Figure 8**

*Risk Analysis Matrix of EBP Project*

Risk Analysis Matrix				
DNP Scholarly Project Name:		Clinical Placement Implementation project		
Student:		Janice Hawes		
#	Risk	Probability Score	Impact Score	Risk Score
1	Student changes positions during DNP program and has to change project as well	2	5	7
2	Unable to get the In-Kind funding for project	3	5	8
3	Nursing Students not completing InPlace according to plan	3	5	8
4	Nursing Students unable to use the assigned preceptor	4	3	7
5	Nursing Students not completing the evaluation process within InPlace according to plan	3	3	6
6	Preceptors not receiving their Thank you letter and Certificate as planned	3	2	5
7	Faculty not wanting to make the change to InPlace	3	3	6
8	Outcomes not resulting in expected outcomes	3	3	6

The next phase was included in the project execution, which required developing project deliverables. These items included creating and presenting an education teaching tool for nursing students and the development of the questionnaire as an outcome measurement tool to be used later. While the execution phase was in process, monitoring and control were also activated. The critical cost and ongoing project progress indicators were requirements during this phase. This phase required that key stakeholders were provided status updates on the

ongoing projects. The final step of project closure included preparing the written findings of the outcome measures to receive approval for the final presentation and the project completion.

### **EBP Model**

The Iowa Model served as a foundation in the planning and implementation of the proposed project. Decision-making, problem-solving, and feedback loops were included to guide the change process. It also consisted of a trial of the practice change before implementation occurred and was designed as an interdisciplinary approach emphasizing use on an organizational level.

### **Change Model**

Roger's diffusion of innovation model offered four main elements: innovation, communication channels, time, and social system. Rogers identified five types of 'adopters' to understand the situations during the planning and implementation phases. Also included was how individuals' diffusion occurs in five stages: 1) knowledge, 2) persuasion, 3) decision, 4) implementation, and 5) confirmation. This model provided a plan to address change with the participants and guide a successful trial implementation with further development and sustainability. In the models of middle-range theory and the EBP Iowa Model, Roger's change theory aligned well with the implementation steps of progressing through the project, as identified in Figure 5. The various aspects of the EBP and Change models were combined in Figure 6 to provide a roadmap for guiding the entire plan.

### **Final Budget**

The project included an estimated budget with actual and in-kind donations. Most anticipated costs were associated with purchasing the InPlace subscriptions for the nursing students (NS). This cost accounted for \$1,031.80 for the initial pilot and an additional \$1,105.50 for the full implementation of this project, as identified in Table 5. These fees were proposed to be offered as in-kind donations from the School of Nursing. The other minor expenses were in-

kind donations, which were identified as salary and office supplies used for training. No additional costs were anticipated at this time within the plan.

**Table 5**

*Proposed Budget Planning for Pilot Project*

Actual Project Expenses				Project Info			updated 8/5/2021
Project Lead:		Janice Hawes					
Start Date:		7/26/2021					
Tasks	Description	Hrs/Units	Rate/Cost	SubTotal	In-Kind Donation	Actual	Comments
Initiation						\$0.00	
Planning							
Execution							
NS Purchase of InPlace	Dr. Chilton to purchase	\$14.00	\$73.70	\$1,031.80	\$1,031.80	\$0.00	Student account access for InPlace F21
NS Purchase of InPlace	Dr. Chilton to purchase	\$15.00	\$73.70	\$1,105.50	\$1,105.50	\$0.00	Student account access for InPlace Sp22
Monitoring & Controlling							
Closing							

### Data Collection

The data collection process was implemented and monitored throughout the implementation plan. A post-intervention questionnaire was administered to nursing faculty and nursing students involved as end-users. The post-intervention questionnaire was distributed in a paper format using a five-point Likert scale and included open comment sections. This tool received prior approval from the DNP faculty advisor. The audits have been established as part of the Timeline to measure progress. These audits consist of data extracted from the InPlace student logbooks. This data assisted in assessing whether compliance was maintained regarding preceptor availability of training and adherence to the BON regulations. The various tools used to evaluate the outcomes determined what changes must be made during the pilot and if a second implementation phase was to be implemented. The data collection of questionnaires, audits, and reports from the InPlace system were developed to measure

outcomes for this specific initial pilot. No permissions were required from the participants as they volunteered their input.

Before the second phase of implementation, adjustments or edits would be completed based on the data collected from the outcome measures of the initial pilot. Additional information collected will be a Qualtrics survey of the 14 initial nursing students to determine how they valued the initial pilot of the placement technology. Their feedback would focus on their resoluteness of return on investment if they were to pay for their subscription to InPlace. Results are pending, which may affect the decision of the next progression of the second trial. The second implementation cycle will be initiated in the Spring 2022 semester using the Clinical Immersion course participants. As the project expands in the second phase, additional data will be monitored and included in the summarized outcome data.

### **Data Analysis Plan**

A preliminary recommendation was for computerized systems to be implemented as a better option than technological applications based on the expected outcomes for nursing students and nurse faculty satisfaction, increased efficiency, and competency compliance. The external and practice-generated evidence from the initial pilot with the LUC clinical immersion course was blended through synthesis to craft a recommendation to support the next steps for implementing a best practice system and expected outcomes.

### **Outcomes Measures**

The outcome measures obtained from implementing the EBP project are identified below in Table 6. Three primary outcomes were determined based on the study findings and reflected the body of evidence and synthesis tables.

**Table 6***Outcome Measurements Tools and Definitions*

<b>Outcomes</b>	<b>Definitions</b>	<b>Measurement Tools</b>
Satisfaction or Supports Technology	Satisfied with InPlace Applications and Components	Nursing Student Questionnaire Nurse Faculty Questionnaire
Accreditation Compliance	Completion of Preceptor Agreement Clinical Documents Preceptor & Agency Evaluations	InPlace System Audit from logbook – provides: Preceptor agreements Completion of each day Completion of nursing skills Completion of daily goals and accomplishments  Queries – provides: Evaluations
Time Management and Increased Efficiency	Improved workflow processes	Questionnaire to NS Questionnaire to Nurse Faculty

Satisfaction or technology support was defined as satisfaction with InPlace applications and components. It was measured utilizing a post-intervention questionnaire with a five-point Likert scale with open comments, including open discussions with the end-users. This data was collected by asking the nursing students to complete the paper questionnaires in which placing their name is optional.

Compliance and documentation improvement was defined as compliance with the Board of Nurse Examiners (BON) and validation that documentation improvements were captured with an automated system vs. a paper system. These outcomes were measured by an audit tool for compliance as identified in the InPlace system query reporting mechanism. The last outcome was time management, increased efficiency, and decreased workflow processes. This outcome was defined as nurse faculty workflow processes decreased, increased efficiency, and overall user satisfaction. This outcome was combined with the same questionnaire previously administered to nursing students and nurse faculty.

## **Data Stewardship**

The data collection was administered after each cohort completed their clinical immersion rotation. The other outcomes were queried from reports within the InPlace electronic system, password protected and maintained by the UT Tyler SON. The paper questionnaires did not require student or nurse faculty identification and were used for this project only. The results were summarized and kept in a private locked office.

The project's sustainability depends on whether a positive change was gained and demonstrated in the results. Outcomes must be accessible to increase ownership and encourage engagement in the continuous improvement of the system (Melnik & Fineout-Overholt, 2019).

## **Dissemination**

The last step of EBP was the dissemination process. The goal was to disseminate positive and successful results to the key stakeholders, team members, UT Tyler nurse faculty and nursing students, and participating hospital managers and staff. The internal stakeholders will be invited to join a zoom session to present the project findings with a PowerPoint presentation to explain the results, followed by a question-and-answer session. The return on investment is critical for this project to be accepted as successful by the key stakeholders. External stakeholders will be shared with the final implementation data. The two main external stakeholders are the two local hospitals where clinical immersion placements occurred. These will be delivered in a one-on-one presentation with the Educators of both hospitals. Should the EBP results demonstrate a reduced nurse faculty workflow process and increased accreditation compliance processes, the desire would include publication acceptance in a journal. This project is a nursing education project, so reputable journals like the Journal of Nursing Informatics or the Nursing Education Perspectives would be target publishers of interest.



## **Chapter 4: Project Implementation, Outcomes, Impact, and Results**

The steps of project implementation, outcomes, the EBP project's impact, and the implementation's results were reviewed following the EBP processes. Melnyk & Fineout-Overholt (2019) stress the importance of effective strategies to promote small changes over time for change to be more effective. Establishing small goals with measurable outcomes provides concrete examples of motivating the vision for change (Melnyk & Fineout-Overholt, 2019). Additional vital strategies include the involvement of disciplines directly affected by the potential change, including early adopters and even those who may have difficulty with change (Melnyk & Fineout-Overholt, 2019). This implementation included using Roger's change theory to identify the various adopters and their effects on the change process. Therefore, the application implementation directly involved nursing students, preceptors, and nurse faculty as critical players in this project.

### **Project Implementation**

This initial project implementation was initiated using a pilot group including nursing students and their assigned preceptors from the UT Tyler Longview campus clinical immersion course. The first cohort included 14 level four students enrolled in the Fall 2021 semester, their identified preceptors, and the nurse faculty for that course. The steps followed the previously described Gantt chart, Figure 6, to align with the EBP process.

The Doctor of Nursing Practice nurse faculty, which are in charge of the EBP programs, and the SON administration approved the project implementation, followed by meetings with hospital educators and UT Tyler stakeholders to proceed with the implementation phase. Next, the author received training from the administrator and administrative assistant who oversaw the InPlace system to build the required components within the InPlace system. This build included the development of logbooks and clinical placements within the InPlace program for the EBP outcome measures. Administrative approval was gained to purchase the students' InPlace

access using in-kind donations. The students were supplied with access and passwords to their InPlace student accounts.

Before starting orientation, an educational program was developed to help with student instructions and an introduction to how the EBP program would be implemented for their participation and expectations. Rodgers et al. (2019) note that a lack of knowledge and skills can create barriers to daily evidence-based care; therefore, all fourteen students attended the clinical orientation, which included the educational session on how InPlace worked and their responsibilities for the course. The InPlace system required entering the students' names, assigned preceptors, and clinical placement schedules. Once the data was entered into the InPlace system, the students and nurse faculty could monitor each clinical placement as scheduled. Upon completing orientation and instructions for the application, students were allowed to proceed with their clinical placement assignments. Before the execution of the clinical placement application, questionnaires, queries, and audits were developed to monitor and evaluate the program outcomes.

The clinical immersion rotation started on August 8, 2021. The nurse faculty's role included rounding on the students and their assigned preceptor during clinical placements. The student, preceptor, and nurse faculty instructor met following the course requirements of their nine shifts' first, middle, and last clinical placements. In reviewing the student's patient assignments, activities, and performance during rounds, the students shared their entries entered in the InPlace system. Most of the students quickly discovered how easily their cell phones allowed access to InPlace instead of desktop computers, providing expedited access to their daily entries during their clinical placement.

The component of the InPlace system that provided tracking and compliance was the logbook. This component allowed for the monitoring of the outcomes. Clinical rounds were completed following the clinical immersion course outline, and each student was monitored for adherence to the course objectives and the InPlace logbook for outcome measures. As the

clinical placements and required hours were concluded, the nurse faculty member held post conferences with the clinical immersion course participants to assist in obtaining outcome measurements.

### **Outcomes**

The outcome components for this project were developed and aligned using the information gathered from the external literature, as seen in the systematic tables. Data aggregation requires using standardized language to allow for the collection of data (Melnyk & Fineout-Overholt, 2019). Data tools included post-intervention questionnaires, audit tools, and data generated from the InPlace system using queries.

### **Project Results**

#### **Demographics**

This population comprised 14 nursing students from the Longview NURS 4338.090L Clinical Immersion course during the Fall 2021 semester. Other participants included nursing preceptors and educators of the two hospitals where the clinical immersion placements occurred. No demographic analysis was completed on the population.

#### **Data Analysis Results**

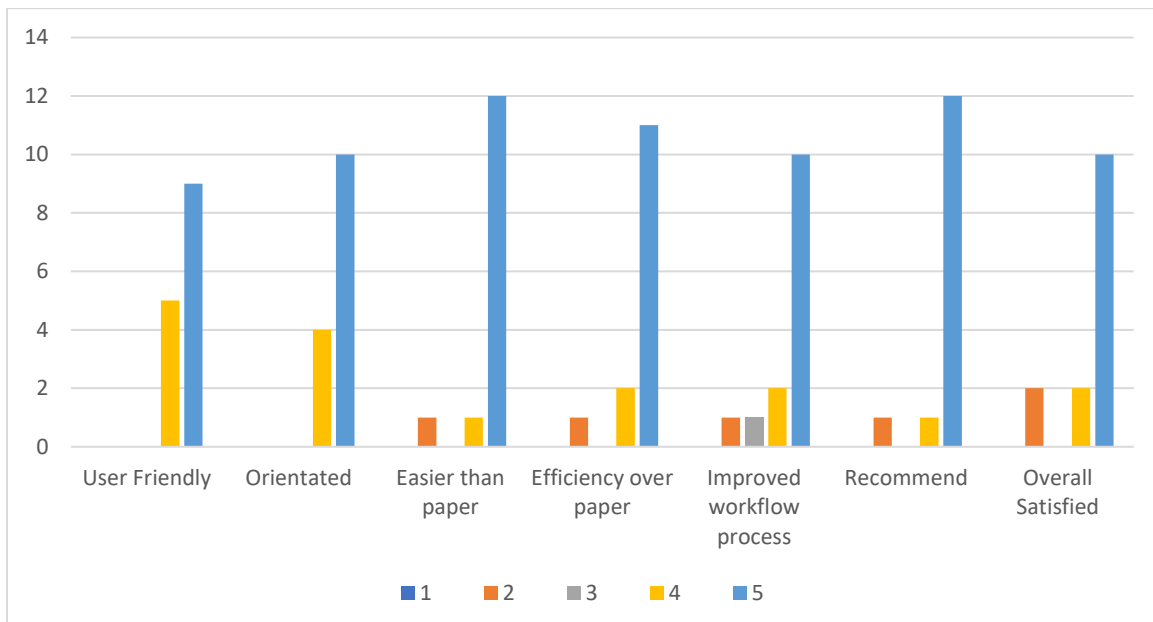
An end-user post-intervention questionnaire was administered to nursing students and nurse faculty. This questionnaire was presented in a paper format using a five-point Likert scale and included an additional section for written comments. Audit tools and queries were implemented to obtain the other outcome measures using the InPlace system as the database.

The seven-item post-intervention questionnaire administered to the students provided evaluative data about to what degree using the InPlace system was perceived in the following areas: (a) being user-friendly, (b) providing appropriate orientation to the system, (c) being more manageable than the paper process, (d) improving efficiency over the paper system, (e) improved processes of workflow, (f) recommending to continue to use, and (g) being overall satisfied with the features and applications within the InPlace system. Figure 9 provides the

results of the questionnaire collected from the 14 nursing students. A few of the preceptors provided verbal feedback in that they were overall pleased with not having to sign and complete additional papers provided by the nursing students in the clinical placement assignments. The trial only included one nurse faculty member who fully supported the system and implementation.

**Figure 9**

*Post-Intervention Questionnaire to Nursing Students*



**Compliance with the Texas BON Requirements**

An audit was completed to determine if compliance with preceptor agreements was achieved as outlined in the course and in keeping with the Texas BON. This data was extracted from the InPlace system. Each student was to have a completed preceptor agreement with each assigned preceptor during their clinical placement. This audit provided a measurement to determine if compliance was met with 100% reported in the audit outcomes.

## **Compliance and Documentation Improvement**

A second audit was conducted to evaluate the compliance and documentation improvements for the individual student clinical documentation components required for the clinical immersion placements. This data was extracted from the logbook developed within the InPlace system and included the student's skills, daily goals, and clinical placement calendar. This automated process replaced three papers with one automatically generated report.

### **Time Management: Workflow Processes and Increased Efficiency**

The data regarding time management from the two indicators of workflow processes and increased efficiency was generated from the end-user questionnaire, as reflected above in Figure 9. Papers were replaced by automation, which prevented the students from printing out the forms, having preceptors sign, and then uploading them into the Canvas site. This new process resulted in time savings for each student of approximately 15-20 minutes for each clinical placement and paper and printing expenses. This change also allowed the nurse faculty to view the document during clinical rounding on the student.

An additional step was taken to compare the time it took to validate the completion of preceptor agreements using the current paper process compared to the automated system. The ability to validate the completion of a preceptor agreement using the InPlace system took five minutes compared to the check and balance of the paper system of 15 minutes to validate. Therefore, this demonstrated increased nurse faculty efficiency using the automated system.

## **Discussion**

Data from InPlace were extracted from the system by use of query reports. Three queries were written and obtained. Those queries provided the compliance of completion of preceptor agreements to align with the BON regulations, as well as other required clinical documentation forms to be completed in the NS logbooks. The questionnaires accounted for the additional results collected from the implementation project. A consensus was determined to be a positive return on investment for the nursing students and the nurse faculty that participated.

## **Meaning of Results**

The data outcomes obtained from the EBP implementation project were collected and summarized using a Decision Matrix shown in Table 7. Collection tools included quantitative, qualitative, and descriptive data results. Nursing student satisfaction reveals that 12 of the 14 (86%) students rated it as an overall positive implementation. Student return on investment is defined as a willingness for the student to purchase the needed prescription for the InPlace system 50% was yes, 21% neutral, and 29 % were not in agreement about being responsible for purchasing. The BON compliance for documentation of preceptor agreements revealed 100 % compliance. Submission of student documents required for the coursework achieved 100% compliance using technology. Time management results were 100% positive for the nursing faculty and students. The completion of NS evaluations of preceptors and healthcare facilities used were met with 100% compliance.

**Table 7***Project Outcomes*

Project Outcomes	Positive	Negative	Percentage
Satisfaction or Supports Technology	1		100% Positive
Nurse Faculty	12 (rated 4 or 5)	2 (rated 2)	86% Positive
Nursing Students			
Accreditation Compliance			
Preceptor Agreements	105/105		100%
Completion of clinical documents	100 completed		100%
Preceptor/Facility Evaluations	100 completed		100%
Time Management and Increased Efficiency	100%		100%
Faculty workflow processes	Validation of Technical System	Validation of Paper System	100%
Faculty efficiency	Time: 5 mins.	Time: 35 mins.	

**Project Process Evaluation**

The process of data collection used a variety of tools and data sets. Qualitative and Quantitative data was collected from the questionnaires and audits using a five-point Likert scale developed from information from the evidence and desired outcomes. The paper-generated questionnaires did not require student or nurse faculty identification and were used for this project only. The questionnaires' results were summarized and kept in a private locked office.

The queried data sets were deidentified. No information could identify the student, either by name, email, or any other identifying information associated with the identification of the individual student from the questionnaires and Qualtrics survey. Additional outcomes were

queried from reports within the InPlace electronic system. The system was password protected and maintained by the UT Tyler SON.

### **Limitations**

The project limitations identified in this study were mainly centered around the issues of preceptor assignments related to the inability of the InPlace system functions for this pilot. For the clinical immersion course, nurse faculty work with the clinical facilities where the clinical placement will take place for each student. The units are assigned, and the clinical facility is then determined and assigned a designated preceptor for each student. Due to COVID impacts on the facilities, the initially assigned preceptor was not always available. There were incidents where the assigned preceptor was out sick with COVID or resigned. Since the original placements were established within the InPlace system, the student's schedules and preceptors were predetermined before their actual first clinical scheduled days and the implementation of this project. This change caused issues with having multiple preceptors from the various clinical days or even locating new preceptors. The InPlace system was not built to accommodate these alterations. Therefore, the compliance with preceptor agreements, the ability for the system to automatically distribute thank you notes, and preceptor certifications were not feasible. The InPlace company was consulted, but no changes to the system were established during this pilot. The recommendation is for vendors to develop a better process for this limitation.

Another limitation was the inability to have the preceptor agreement built into the InPlace system instead of using a paper format. It was determined that the addition of providing preceptors access to the InPlace system to accommodate an electronic signature during this pilot was not feasible. Although three other paper formats were eliminated, the preceptor agreement was maintained in a paper format. It was therefore tracked for compliance as an entry into the logbook.



## **Conclusion**

The project implementation steps, outcomes, impact, and results were presented and discussed. The outcomes findings were collected and displayed in the Decision Matrix (see Table 8). The overall findings revealed alignment with the research evidence. Success was demonstrated with positive feedback from the nursing students and nurse faculty. The EBP project implementation in the clinical immersion course proved successful based on the outcome measures established at the beginning of the project. There are still opportunities to reduce paper-process using computer technology. The nursing student and nurse faculty workflow processes demonstrated improvements and satisfaction overall. The ease of using cell phones instead of relying on the desktop allowed the students and nurse faculty more flexibility during clinical placements in the clinical setting. Upon review of the outcome data, the decision not to expand the project was agreed upon due to the project's success revealed in the first pilot. It was concluded that the additional in-kind financial contributions needed from the school of nursing would not outweigh the minor changes that could be contributed to the overall plan.

## **Chapter 5: Practice Implications**

This chapter includes implications of project sustainability and implications. The various dissemination methods for this EBP project will be reviewed.

### **Sustainability**

Sustaining change from an EBP project requires that infrastructure aligns expectations and organizational structure with the strategic vision and plan for a culture based on evidence (Melnyk & Fineout-Overholt, 2019). The University's school of nursing administration will determine the project's sustainability as to whether the outcome of this project fulfills their determination of the return on investment.

### **Internal Implications**

The outcomes generated from the Decision Matrix reveal positivity and support for using technology. The technology system, InPlace, used in this EBP project for the NURS 4338 Clinical Immersion class, has been developed. Training materials are available for release to the UT Tyler SON if they choose to implement the project further.

Additional considerations for sustainability could include the potential benefits of using InPlace to help students use the system to help capture jobs upon graduation and even assist them in generating possible letters of recommendation from InPlace. Could the healthcare system use the student's skills checklist to assist them in onboarding the newly hired students who used InPlace during their program? What is the potential of using the InPlace system to help with new BON rules that could monitor compliance for the school of nursing? The ability to use technology can be an overall plus for better collaboration between the student, the school of nursing, and the healthcare agencies. This EBP project was targeted at the level 4 clinical immersion course. Additional courses and other project expansion could lead to potential additional benefits to the overall UG nursing program.

### **External Implications**

Potential external implications resulting from this EBP project include benefits to the healthcare partners' ability for increased communication techniques and planning with the UT Tyler SON UG program. These benefits could include better clinical placement planning, improved communication, reporting methodologies, and better use of healthcare preceptors. This EBP project could contribute to increased collaborations for the nursing students and nurse faculty with the shared responsibilities of our healthcare partners.

### **Dissemination Methods**

The final step in the EBP is the dissemination, and the information results are communicated to the appropriate audience to assist in determining the value of the project (Melnyk & Fineout-Overholt, 2019). The primary goal of disseminating the evidence is to facilitate the transfer and adoption of research findings into evidence-based quality improvement projects, as described by Melnyk & Fineout-Overholt (2019). The dissemination of this project has been communicated to the stakeholders at various stages of the implementation project. The final presentation will be presented to the key stakeholders using an oral format. Outcome findings will be shared, and open dialogue will be made between all parties. Additional dissemination methods will occur using written publications to potentially interested entities such as technical publications and nursing journals.

### **Conclusion**

Based on the evidence and the program outcomes, the project revealed that applying technology in a clinical setting could improve faculty workflow and efficiency and increase BON compliance with the ability to export reporting methods more easily. It was identified by the students and nurse faculty that worked within the implementation pilot that the InPlace system was an easy system to develop and use.

Paper processes can be converted into automated processes using the InPlace system currently used in other nursing programs within the SON. These processes were not only a

benefit to the students but also to the nurse faculty, which promoted workflow processes and increased efficiency. An additional benefit was the reduced paperwork requirements for the hospital preceptors allowing them more time to assist in the students' learning objectives. Other considerations were the inconsistent process of student and preceptor evaluation systems. The InPlace process can assist in accommodating that vital feedback that is not only required by the BON but also a necessary process for providing methods to help in student and potential healthcare facility evaluation improvements. The current evaluation processes are inconsistent between healthcare facilities where clinical placements are used. This collaboration could be a beneficial endeavor.

It is noted that improvement processes are still needed relating to the preceptor assignments that were affected during the COVID pandemic. Additional alternate preceptors were placed with the students not previously identified as assigned preceptors; therefore, the current system did not allow for the automation of thank you notes and certificates for the preceptors. Further development into the InPlace system needs to be addressed to accommodate these unexpected changes to allow for complete expectations of the improvements in the system.

Practice and student values must be considered when adopting and sustaining this EBP project in the organization. Financial resources must be determined, whether the cost would be the students' or the University's responsibility. The return-on-investment measures in satisfaction in practice, nursing student and nurse faculty workflow processes, and increased automated compliance factors will need further evaluation and determination by the organization.

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