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# The Effect of In Situ Simulation on Teamwork Attitudes in Nursing Students

Janice Kaye Fuson  
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The Effect of In Situ Simulation on Teamwork Attitudes in Nursing Students

by

Janice Kaye Fuson

A capstone project submitted to the faculty of  
Gardner-Webb University Hunt School of Nursing  
in partial fulfillment of the requirements for the degree of  
Doctorate of Nursing Practice

Boiling Springs

2015

Submitted by:

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## Abstract

Nursing students are not adequately trained in teamwork principles. Positive teamwork has been identified by governmental and accrediting bodies of healthcare to be an essential element in patient safety. TeamSTEPPS© is a program developed by the Department of Defense adapted to healthcare as a cost effective method to change the culture of healthcare organizations. A capstone project that implemented in situ simulation using a TeamSTEPPS© tool was conducted in a rural North Carolina nursing program. Eighteen students participated in the simulation and completed a pre and post TeamSTEPPS© Teamwork Attitude Questionnaire. Mean scores were noted to be considerably lower post intervention indicating a positive effect on attitudes could be attributed to the intervention.

*Keywords:* TeamSTEPPS©, in situ simulation, nursing students, teamwork

## Acknowledgments

The Lord has made all of this possible. There were many challenges that were overcome in order to make this project happen and without God I would not have completed. I dedicate this to my family and friends who always believed in me, even when I was struggling. I would like to state firmly that I appreciate my husband Mike for being such a rock and dependable partner during this journey. Lastly, I would like to thank my committee members Dr. Lisa Barnes and Anne Hemmons who came to my rescue and a huge Michigan thank you to Dr. Miller. Dr. Miller you have been such a comforting presence during this process of multiple capstones, I cannot thank you enough.

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## **CHAPTER I**

### **Introduction**

Good communication is at the center of any productive team. In healthcare, effective teamwork has been shown to increase not only the productiveness of the team, but the overall quality and safety of the services provided. Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS ©) is a method with multiple tools and strategies that can be used in conjunction or separately, to address issues that may arise in a variety of team settings.

Developed over 20 years ago by the Department of Defense (DOD) to reduce jet flight errors, TeamSTEPPS © has been collaboratively adapted by the DOD and the Agency for Healthcare Research and Quality (AHRQ) to be used in healthcare settings (Clancy & Tornberg, 2007). Teamwork and effective communication among these teams will be essential for nurses in the not so distant future. By the year 2025, the underbelly of the nursing shortage iceberg will be colliding with the current undernursed healthcare system in the United States (Buerhaus, 2009). According to Buerhaus (2009), the 260,000-nurse growth projected in the shortage of nurses may result in the largest shortage experienced in the United States since the mid-1960s.

### **Problem Statement**

Nursing students are not adequately prepared to work in a team environment. This is a problem because it may affect turnover, patient care, and overall patient care quality.

If literature shows that teamwork and communication skills are imperative to quality care and patient safety, then nursing curricula needs to teach these skills just as

readily as other skills that are essential to practice (Robertson et al., 2010). According to Smith, it is “critical to prepare nurses for future practice to work in teams” (Smith, 2014, p. 181). TeamSTEPPS is not just a program but also a cultural change process. Changing cultures from the inside can prove to be difficult, ingraining principles, as foundational practice can be life changing.

The Institute of Medicine’s (IOM) (1999) publication of *To Err is Human* pointed out 98,000 deaths per year could be eliminated by implementation of different processes, mostly surrounding teamwork and communication. Their recommendation applied to all healthcare settings inpatient, outpatient, and institutions of healthcare education to increase the tools, knowledge and research around safety (Institute of Medicine [IOM], 1999). Since 1999 healthcare has become increasingly complex and the teams providing direct care are more diverse. Studies from nursing education are starting to pick up the mantle by addressing simulation and team experiences, but still the challenge and the responsibility for assuring team definition, adoption, acculturation and trust lie with the organization and the culture where the team will function.

In sports, players are taught how to play ball in many different high schools; they then transfer to college, and then to professional sports. These players are acculturated and there is no need to reinstruct players on team functioning; instead, they can focus on the strategies for each game. Nursing education can be the same, instructing students in team principles so that when nurses come into the practice setting they are safely able to achieve goals because it is a part of their culture.

### **Justification of Project**

Justification for this project is identified in the literature. According to the IOM (1999), teamwork and communication failures may lead to adverse events. Vital information is lost and in some areas the break down in communication endangers the wellbeing of patients and puts nurses at risk for causing adverse errors and sentinel events. Healthcare is already an expensive commodity; adding error into the equation only makes medical services more expensive. In addition to expense, one must examine the necessity to decrease an already decreasing workforce in order to alleviate costs (United States Agency for Healthcare Research and Quality & United States. Office of the Assistant Secretary of Defense (Health Affairs) [AHRQ], 2008).

This project involved the use of TeamSTEPPS© principles and applied them to the educational environment. The nurses of tomorrow will need fundamental teamwork principles in order to practice safely and meet the ever-changing climate of healthcare.

### **Purpose**

The purpose of the capstone project was to attempt to increase the attitudes nursing students have regarding teamwork. The process used to instill teamwork principles involved the use of in-situ or “in situational” simulation to engage students in their current course content, in this case behavioral health content, using the simulation to guide and reinforce a learned concept of SBAR (Subject, Background, Assessment, Recommendation) reporting and learn the teamwork principles of leadership, mutual support, communication, and situation awareness (United States Agency for Healthcare Research and Quality & United States. Office of the Assistant Secretary of Defense (Health Affairs) [AHRQ], 2008).

### **Project Question**

The project question for this capstone was: Will in-situ simulation result in an increase of teamwork attitudes in nursing students?

### **Definition of Terms**

In situ simulation is not a readily used term in healthcare. According to Rosen, Hunt, Pronovost, Federowicz, and Weaver (2012), in situ simulation is a blended form of simulation in which the simulation is imbedded in real situations. For this project's purpose the simulation was imbedded within the context of real class material as a spontaneous breakaway from lecture.

Core teamwork principles are at the heart of TeamSTEPPS<sup>©</sup> and will be referred to in the paper as a grouping or as individual principles of behavior. These behaviors are defined individually for complete understanding. Team Leadership is defined as the ability to coordinate the activities of the team. Situation Monitoring is defined as the whole team being aware of their common environment and making adjustments in tasks as necessary. Mutual Support refers to the shifting of responsibilities to compensate for a changing environment. Communication refers to the changes in information from sender to receiver. In combination these will be referred to as teamwork principles or properties.

### **Summary**

In summary, teamwork is a concept most individuals would readily state they were familiar with, but a review of the literature revealed nurses were not well versed in actual teamwork principles. Nursing students have little to no exposure to teamwork training as provided by TeamSTEPPS<sup>©</sup> or other AHRQ recommended programs. The result of this inadequacy leads to a problem when evaluating the satisfaction of new

nurses in the profession, the quality and safety of the care patients are provided and the overall costs of healthcare. This project looked at the use of in situ simulation to increase student attitudes regarding teamwork principles

## **CHAPTER II**

### **Research Based Evidence**

#### **Review of Literature**

Nursing students are not readily able to adapt to a teamwork environment once they have graduated from nursing school. Nursing education does not adequately integrate teamwork principles in the nursing curricula. This capstone project used in situ simulation to increase teamwork attitudes in nursing students. The purpose of the project was to increase attitudes within the academic setting thus increasing the exposure students have to teamwork principles. It has been shown that attitudes help to build a cultural change, which is needed in order to integrate teamwork principles into everyday behavior.

This literature review examined teamwork principles and how they correlate to changes in behavior and changes in practice outcomes. The use of in situ simulation was discussed and how it is used both in academia and in health care settings. Relevant gaps in literature are presented along with the strengths and weaknesses of the literature provided in this review.

Using Cumulative Index for Nursing and Allied Health Literature [CINAHL], Google Scholar, Bulldog Search, and Sage search engines, the Project Coordinator (PC) conducted a search of relevant terms. The terms explored were teamwork, team, in situ, TeamSTEPPS ©, health care, nursing students, nursing, students, and simulation. Many articles were found but a lower number were noticed among academic nursing journals.



## **Teamwork Non-Healthcare Settings**

Crew Resource Management (CRM) was developed in the 1990's out of recognition that human factors were to blame for safety issues in airline crashes rather than mechanical failure (Stout, Salas, & Fowlkes, 1997). Stout et al. (1997) conducted a randomized control study using 42 military pilot students. They were divided randomly into a team trained group and an untrained control group. The average hour's flight log in the trained group was approximately 155 flight hours while the control group double the team trained group at approximately 365 flight errors. The researchers also attest that the previous naval flight training of the control group may have skewed their data.

Team training was provided for the test group over two days, while the control group continued with normal training procedures. Specific simulations were provided over 30 minutes, which emphasized the teamwork principles of situation monitoring, and communication. A teamwork attitude survey entitled Crew Member Attitude Assessment (CRMQ) established in 1988 by Heilmreich which is the foundation for the TeamSTEPPS © Team Attitude Questionnaire (T-TAQ), was administered to both groups before and after training. The T-TAQ was the tool used by the PC in this capstone project (Salas, Fowlkes, Stout, Milanovich, & Prince, 1999).

There were other variables attached to this study such as training reaction, knowledge, and behavioral performance. Testing of many variables can impact research data; however, all the results indicated a strong effectiveness in the outcomes. Specifically addressing crew attitudes, the results were significant with an overall p value of < 0.01. The trained group's scores increased pre and post administration where the

control group's scores did not and in fact scores went down. The conclusion was that team training did positively affect crew or team attitudes. (Salas et al., 1999)

In a quasi-experimental study that evaluated the value of using simulated scenarios for lean engineering practices, Shtub, Iluz, Gersing, Oehmen, and Dubinsky (2014) used two large industries to test usefulness. Simulation Based Training (SBT) was the basis for developing what the researchers called a Project Team Builder Simulator (PTB). The researchers took the PTB to Rafael Advanced Defense Systems Ltd., which develops defense systems for the nation of Israel, and to IBM Haifa Research Laboratory, which is the largest laboratory other than the United States where managers from different Research and Development settings were selected to use the PTB.

A five-step utility value analysis was conducted to determine usefulness of the PTB, in terms of team building, communication and having a shared understanding of team goals. The number zero indicated 0% usefulness and 9 indicated direct usefulness (Shtub et al., 2014). The results indicated that the PTB was directly useful with teamwork lean principles and would be implemented by those two companies.

For decades the aviation industry has used simulation based activities to instruct on teamwork principles. From aviation most modern teamwork based programs are derived and researched. Sexton, Thomas, and Helmreich (2000) conducted a large study in 2000 which involved 1,033 medical professionals and 30,000 cockpit crewmembers to survey the stressors and teamwork perceptions between the two different work environments.

The cross-sectional study used a team perception survey that evaluated mutual support, team construction, communication and situation monitoring. The results found

that although the work duties seemed to be dissimilar, the perceptions of the pilots and surgeons were similar and a correlation was also found between the crew and the patient care staff.

The junior staff and health care staff viewed teamwork perception at a low of 24%. The pilots and the surgeons on the contrary viewed themselves as proficient in their perception of teamwork principles with a higher value at 64%; however, it is important to consider that neither of these values was remarkably high (Sexton et al., 2000).

The researchers surmised the similarities between the two groups and the gaps in perception contribute to the barriers in debriefing. The similarities in the two groups also contributed to breakdowns in process that later present themselves as sentinel errors. The fact that surgeons and pilots have similarities caused the AHRQ to begin emphasizing teamwork principles in healthcare.

Continuing to evaluate teamwork training as it pertains to healthcare and healthcare academic arenas is essential as a connection can be made between industrial safety and patient safety. Using the above stated search engines as well as TeamSTEPPS© Master Trainer material the project coordinator was able to collect a vast collection of research that adds to the body of evidence to justify the project.

### **Teamwork in Healthcare Settings**

Davis, Miller, Riley, and Hansen (2008) examined in situ simulation in a pilot study conducted in an obstetrical setting. Six community hospitals and academic hospitals were selected to be a part of this quasi-experimental study to determine the effectiveness of in situ simulation on attitudes regarding safety and teamwork. The entire

organization was given a Safety Attitudes Questionnaire (SAQ), which features the teamwork principles of communication, team structure, and situation monitoring as a part of the questionnaire. The obstetrical departments were chosen as the only sites for in situ simulation. At each facility the obstetrical team would be presented with three scenarios to work through with a brief, huddle and debrief during the simulation.

The scenarios were real events that happen in an obstetrical unit. The researchers had the simulations organized and facilitated to bring out teamwork principles such as communication, situation monitoring, mutual support, and team structure. The in situ simulation also integrated the action of the Situation, Background, Assessment and Recommendation (SBAR) into the scenario, which is a major initiative of the TeamSTEPPS © curricula.

The results were that the repeated SAQ given to all six hospitals had scores that declined except in the area of obstetrics, where the project was conducted. This SAQ was given to employees every year by the organization. The researchers who also indicated that the change was significant enough to keep conducting in situation simulation in obstetrics and move the simulation to other departments as well did not statistically give the results. Another note is that SBAR was consistently used after the final debriefing by each team, marking a 100% in compliance at the end of the project (Davis et al., 2008).

In situ simulation was used in an intensive care unit to evaluate team competence. Gunderson, Solligard, and Aadahl (2014) conducted a randomized study which involved 72 nurses in a critical care area. The objective was to examine the feasibility of using in

situ stimulation as a means to increase team competence rather than traditional didactic methods.

Data was collected over a period of three months. A one-hour lecture on SBAR communication was given to Group A or a simulated in situ experience was given to Group B. The groups were divided randomly and both groups were video taped. Using the Anesthetics' Non Technical Skills (ANTS) taxonomy system book, blind assessors were used to evaluate the videos using the lecture and teamwork principles. A Likert four point scale was utilized which indicated four as very good and one as poor. No difference was found determined between the two groups. Subjective data indicated the team without didactic did prepare for emergency situations quicker than the didactic group (Gunderson et al., 2014).

The researchers concluded that the smaller sample size and the chaotic nature of the ICU made it difficult for the simulations to be conducted on a routine basis. However, the researchers did continue to endorse the use of in situ simulation in the patient care setting to help identify safety concerns.

The University of Michigan ascertained a one-hour virtual simulation could be used to improve teamwork principles among staff nurses. Kaleish, Aebersold, McLaughlin, Tschamen, and Lane (2015) provided a simulation that focused on team construct, communication, situation monitoring, and mutual support.

A pre and post team attitude survey was administered which indicated significance on overall teamwork with a p value of <0.010. In the subsets involving team communication, trust, and backup all had a significant effect from pre to post survey

(Kalsich et al., 2015). The conclusion was simulation could be an effective tool to increase teamwork principles.

The veteran hospital system is the largest national hospital system in the United States. A retrospective study with a control group using the TeamSTEPPS© principle which focused on team structure, communication, situation monitoring, and mutual support was used by researchers to determine whether their project had any effect on safety and teamwork attitudes (Ploneien & Williams, 2015).

After evaluating 108 facilities with over 108,000 cases it was determined hospitals that utilized TeamSTEPPS© principles had an 18% reduction in mortality compared to institutions that did not have the process in place. TeamSTEPPS© utilizes in situ simulation as a part of the curricula that is essential in the briefing and debriefing process (Plonien & Williams, 2015). The process of simulation was not directly measured, however the process of using the curricula as a whole suggested that simulation was utilized as well as part of core curricula content.

### **Simulation in Academia**

Scenarios, which focused on team structure, delegation, safety, and quality assurance, were used in simulated experiences with 97 nursing students in a simple posttest study conducted by Kaplan and Ura (2010). The scenarios were conducted using simulation-based learning (SBL) that had case driven information designed to inspire team behavior. In addition the students debriefed after each scenario.

The students were given a simple post activity survey that indicated 78% of the students positively answered the team SBL was effective in their learning. The limitation of the study was the lack of a pre teamwork survey. The researchers determined that

there was enough evidence to continue the use of SBL in teams of teaching teamwork exercises (Kaplan & Ura, 2010).

One of the largest interdisciplinary studies involved fourth year medical students (n=235) and senior nursing students (n=203) and used high fidelity simulation with a video debrief to determine the efficacy of simulation as a teamwork learning pedagogy. Hobgood et al. (2013) used in situ simulation to reinforce teamwork concepts of communication, team structure, situation monitoring, and mutual support. Teamwork skills were seen to immediately be affected post brief of the intervention; however, long term results were determined to be not as significant.

The pre and post team attitude survey also showed significance regarding attitude and knowledge of team concepts with a p value of  $< 0.001$ . This was enough to cause the researchers to determine it was worthwhile to use in situ simulation as a learning intervention along with continuing a longitudinal study of long-term efficacy (Hobgood et al., 2013). The high fidelity of the team experience and the low costs for the results caused this to be a foreseeable teamwork intervention in the future.

Forty teams at a university setting took part in a randomized crossover study by Frengly et al. (2011). The teams were evaluated at pre, post, and three months after intervention. The university used case study with mixed in situ simulation as a teaching strategy to teach teamwork principles of communication, team coordination, and situation monitoring. Scenarios were developed to induce these types of behaviors and debriefed after the intervention.

The results of the research showed significant improvements post and three months after the training. The p values for overall teamwork, mutual support,

communication and leadership coordination were all a p value of  $< .002$ . The researchers asserted their conclusion that mixed simulation with case based scenarios was an effective teaching modality for teamwork skills (Frengley et al., 2011).

### **Gaps in Literature**

In situ simulation is a relatively new process in which best practice has not been established. This has led to a gap in literature. In terms of academia where “real” experiences comprise of the classroom didactic it is even more difficult to find situations where in situ simulation is used. In clinical setting real time simulation provides a profound learning experience. For a student, reality is the classroom. Deviating from a set schedule to introduce a simulated scenario is in situ simulation, which can be difficult to implement since it is meant to be somewhat spontaneous. There is little research that indicates the value of in situ simulation for nursing students (Rosen et al., 2012). This project will help in an accumulated body of knowledge. However, because most of the focus is on healthcare facilities and not academia still much is needed in order to correlate any efficacy. An assumption is made that since healthcare workers do not have the fundamentals in teamwork abilities that students thereby lack this skill set as well (Kutzin, 2010).

In situ simulation and high fidelity simulation are not well researched among nursing students. Role-play differs in that there is not usually a debriefing following the scenario and an immediate reenactment. Highly structured simulation is usually long and clinically driven; in situ involves in the moment strategies that function like simulation but during a shorter period of time (Kutzin, 2010). While there is research that suggests simulation is just as effective a teaching strategy as other interventions, the low cost of



in-situ simulation makes the need for further research noteworthy.

### **Strengths and Limitations of Literature**

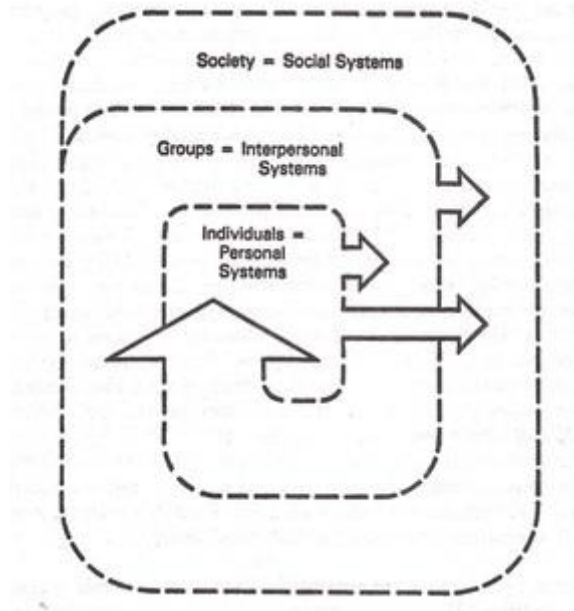
Although teamwork training is becoming more evident in the literature due to the IOM and AHRQ recommendations, there are definite gaps. Nursing education is behind medical education when evaluating team training. Most of the nursing research in this area is physician driven; little comes from the field of nursing and less with any form of theoretical background.

The barriers that present with these gaps in research are in identifying best practice. Although the research indicates that simulation has benefits to learning, does it promote or have an effect on attitudes? Qualitatively in situ simulations appear to have benefits. Quantitatively it is hard to find studies that indicate great significance. The agreement is in that in situ simulation has little to no cost and thereby any positive result could be viewed as beneficial. More research is needed in this area to assure efficacy for the future (Rosen et al., 2012).

### **Theoretical or Conceptual Framework**

This project used the theoretical framework of Imogene King. The Theory of Goal Attainment, developed by King, is considered a Grand Theory because it provides broad perspectives for nursing practice. King's theory is an open model theory with a broad conceptual framework so there are many areas and ways that the theory can be applied (Sieloff, 2006). Mutual support and communication are at the heart of the TeamSTEPPS model; therefore, mutual goal setting and attainment of team goals make this model perfect as the project framework (Sieloff, 2006).

Figure 1 gives a visual perspective of the conceptual framework developed by King. For the purposes of the capstone the individual and the group systems are highlighted.



*Figure 1.* King's Conceptual Model

Figure 2 is a visual representation of Goal Attainment Theory developed by King. The individual nurse and client come together with their own perceived judgments and perceptions and through continual feedback the nurse and client develop an action plan that gradually moves into a joint interaction to obtain a mutually agreed upon goal. The result of this relationship decision as defined by King is transaction. Transaction is the outcome of this constantly moving loop of information that continues for as long as the relationship remains intact (King, 1981).

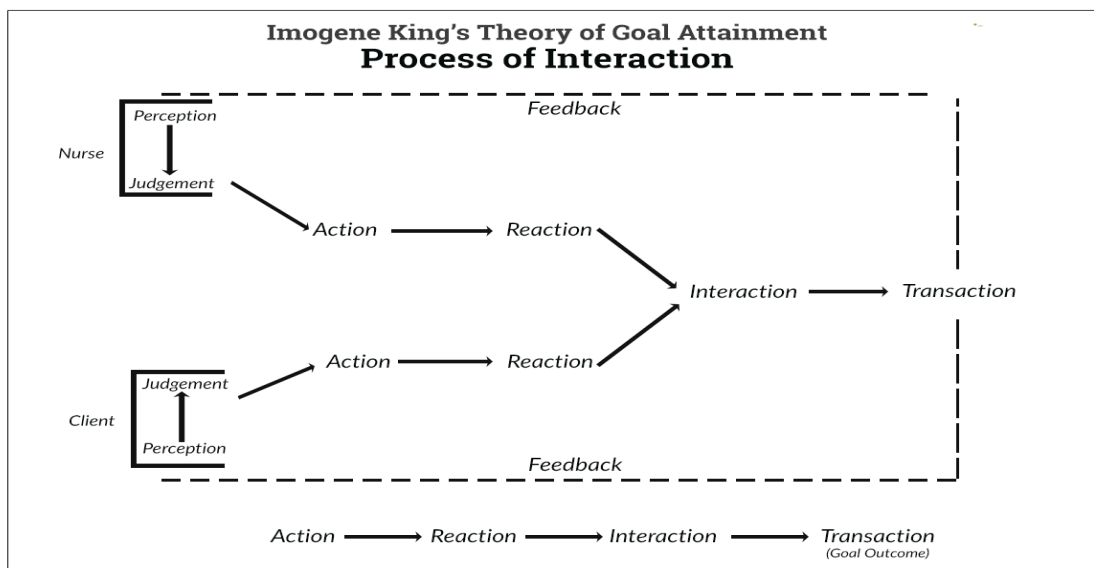


Figure 2. King's Goal Attainment Theory

According to King (1986) the relationship between teaching and learning is a “reciprocal” open relationship. These relationships constantly influence each other. “The central focus of King’s framework is man as a dynamic human being whose perceptions of objects, persons, and events influence his behavior, social interaction, and health” (Williams, 2001, p. 25). King defines a social system as one “within society that provides formal programs for individuals to acquire knowledge and skills” and “should help individuals live a useful happy life” (King, 1986, p.59). Formal team training using in-situ simulation can be demonstrated as social groups work together to acquire skills and result in effective satisfying outcomes. “Education should help persons learn how to solve problems and cope with stress and change” (King, 1986, p. 56).

The primary assumption of the Theory of Goal Attainment is the end result of a nurse client interaction, or in this nurse/team member, will be both parties meeting and reacting to each other based on individual perceptions, judgments, and actions. Mutual goals are set through interaction and transaction occurs when the goals are met (Husband, 1988).

Nurses interact with interdisciplinary teams in an intimate environment where the goal is mutually set. The team will demonstrate knowledge and capability to meet a certain outcome or transaction. This involves trust and consent from each team member that they will be treated with respect and fairly. The team will assess the situation clinically and strategically using in-situ simulation. Using this information the team will agree on a mutually set goal if possible, which will be to provide safe, effective and efficient care in the situation presented to them. The project was conducted in this manner.

Figure 3 depicts the TeamSTEPPS conceptual model. Using this model and the goal attainment model the project coordinator adapted a conceptual model for the project. Focus was given to the interaction and transaction of King's theory. The project coordinator kept these principles within the King framework in order to be true to both philosophies.



*Figure 3.* TeamSTEPPS Conceptual Model

Figure 4 shows the adapted model created by the project coordinator merging King and TeamSteps for the purpose of the project.

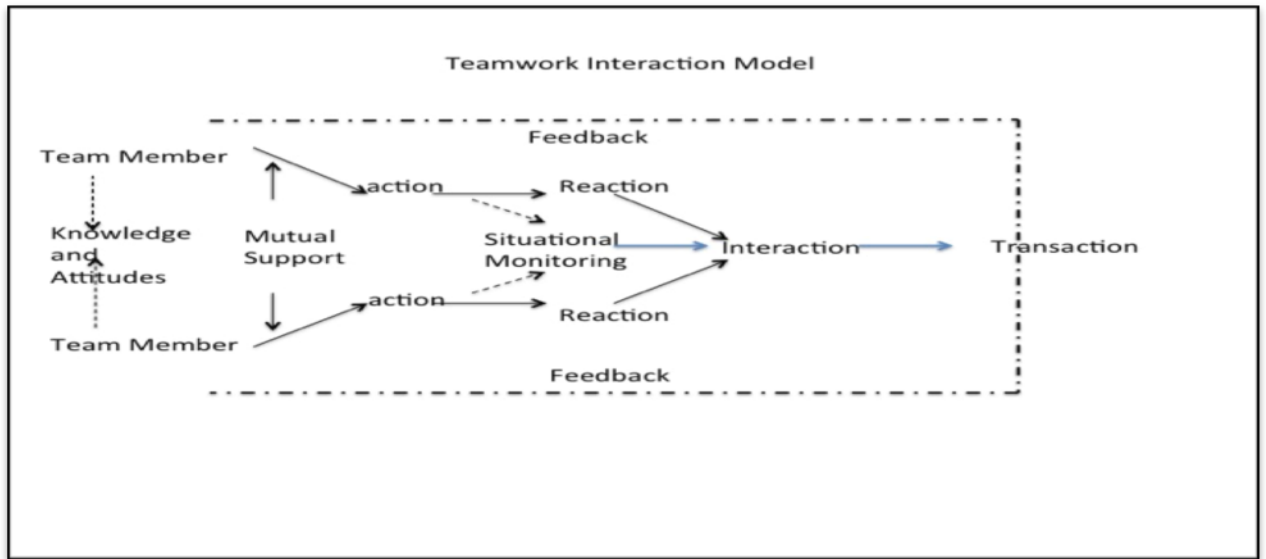


Figure 4. King's Goal Attainment with TeamSTEPPS Principles

Focusing on groups, as illustrated in Figure 1, and team member to team member interaction as described in Figure 4, the connectivity of mutual goal setting can equivocate with mutual support in a clinical setting. King defines mutual goal setting as a contractual agreement between two parties in order to complete a goal, or transaction. Without this agreement transaction does not occur and goals are not met. Mutual support was defined earlier in Chapter I.

King's theory and TeamSTEPPS© merge together in a functional way to adequately describe what happens when teams communicate. Each member must use the principle of mutual support and must have an understanding and correct attitude to accomplish mutual goals. In terms of communication, King's work is paramount, but the gap in research due to the broadness of the concepts makes it hard to prove in practice.

### **Summary**

In summary, the research found in literature is lacking in the area of in situ simulation but abundant in teamwork training and its benefit to healthcare. The significance of team training to military air training resulted in the absence of jet fighter crashes. Research of teamwork training and in situ simulation in healthcare areas resulted in less surgical errors and higher patient satisfaction scores. Lastly, in academics teamwork training and simulation increased attitude and perception scores regarding teamwork. Implementing a project with low cost into an academic program appears to have evidence of potential long-term benefit.

## **CHAPTER III**

### **Project Description**

Nursing students are not adequately prepared to work in a team. Literature has shown that in situ simulation is an adequate tool to teach teamwork principles and increase attitudes about teamwork among participants. This project sought to increase teamwork attitudes of nursing students by use of in situ simulation during regularly scheduled classroom activities. The project was designed to introduce teamwork principles by using in situ simulation to reinforce previously mastered course content, a commonly used communication strategy. Situation, Background, Assessment, and Recommendations (SBAR) is a commonly used communication principle in healthcare today and is also a TeamSTEPPS® strategy in communication. This chapter will describe the process of the project that was implemented.

### **Project Design**

The project used a quasi-experimental quantitative pre and posttest design to examine if in situ simulation had any effect on teamwork attitudes of nursing students. The project coordinator used TeamSTEPPS® principles of simulation, previously defined and the Teamwork Attitude Questionnaire (T-TAQ) for the project. The project was purposefully conducted during regular class instruction time. The course content was discussed with the instructor prior to implementation and it was determined that 30 minutes would be allocated for the instructional in situ simulation to occur.

### **In Situ Simulation**

The in situ simulation was designed around the course content of mental health disorders, specifically Bipolar Disorder. The objective was not to teach course content but to enhance the learning environment by allowing the students to be immersed in the



currently learned content. Prior to the simulation five minutes was spent by the project coordinator to discuss the principles of SBAR communication. The classroom instructor assisted in the reinforcement of this previously learned content.

The simulation situation was designed by the project coordinator to be a brief skeleton scenario. The project coordinator is a Master Trainer in the principles of TeamStepps© and thereby trained in the technique of in situ simulation. Table 1 illustrates the roles of the students. The only other instruction was that a bipolar patient would experience an escalated behavior incident involving a family member. The project coordinator who served as the facilitator in the simulation simulated the family member role. The students were randomly selected by counting off in threes. Five students with the number three were selected for the simulation. The remaining students were asked to be observers of simulation. The selected five students were removed from class briefly for instruction. There was no videotaping of the simulation due to respect for student privacy; observers and the instructor were requested to take notes if necessary.

The in situ simulation was performed twice. Both simulations lasted for approximately 10 minutes with a five minute brief in between scenarios and a five minute debrief after the second simulation for a total of 30 minutes simulation time. The results of the simulations will be discussed in a later chapter. The instructor of the class was a non-participant observer. The students were fully aware that the simulation was not to be evaluated for a grade nor would any content directly delivered from the simulation be evaluated. The in situ simulation was meant to enhance content and introduce teamwork principles.

Table 1

*Description of In Situ Simulation Roles*

Role	Simulation Description
Patient: Student #1	<ul style="list-style-type: none"> <li>• Escalated behavior with family member</li> <li>• Behave angrily and verbally lash out at staff</li> <li>• Be redirected when calmly approached</li> </ul>
Family Member: Project Coordinator	<ul style="list-style-type: none"> <li>• Facilitate simulation</li> <li>• Continue simulation experience until SBAR communication used or 10 – minutes in time elapsed</li> </ul>
Primary Nurse: Student #2	<ul style="list-style-type: none"> <li>• Call for assistance</li> <li>• Establish Leadership Role by delegating to staff</li> <li>• Use SBAR communication with staff</li> </ul>
Secondary Nurse: Student #3	<ul style="list-style-type: none"> <li>• Assist Leader when called</li> <li>• Use SBAR</li> <li>• Call for assistance if needed</li> </ul>
Nurse Aide: Student # 4	<ul style="list-style-type: none"> <li>• Assist nurses when requested</li> <li>• Use SBAR</li> </ul>
Safety Officer: Student # 5	<ul style="list-style-type: none"> <li>• Obey staff instruction</li> </ul>

## **Sponsors and Stakeholders**

The project was introduced as a process improvement endeavor for a community college in northeastern North Carolina. The campus of the college resides in a mostly rural portion of North Carolina and the School of Nursing has a relatively low enrollment. The project was presented to the instructor, director of the School of Nursing, and president of the college with the understanding that process improvement is a pivotal part of nursing practice and therefore should be introduced at the student level. Approval was obtained by the above stakeholders and permission to proceed was granted in writing by the director of the School of Nursing. Permission was granted to proceed by the project coordinator's university Institutional Review Board (IRB) with the understanding that the project was a process improvement endeavor and not a research project.

Added to the above stakeholders are the community where the college resides, the taxpayers that benefit from inexpensive teaching techniques, the students who will benefit from team training, and the overall healthcare workforce. Aiken, Cheung, and Olds, (2009) has shown in a multitude of studies that job satisfaction and retention of nurses are directly linked. Research has also shown that teamwork efficiency and job satisfaction are directly linked. Keeping nurses in the workforce will be essential as the nursing shortage looms. Small communities may suffer larger deficits should nurses choose alternative careers or decline to enter the workforce (Kutney-Lee et al., 2009). The project coordinator chose a small rural college for these reasons.

## SWOT Analysis

The setting was analyzed looking at potential barriers and benefits using the Strength, Weaknesses, Opportunities and Threats (SWOT) approach. This powerful yet very easy tool was used and helped to guide the project coordinator in a manner that was more efficient and specific to this particular culture Table 2.

Table 2

### *SWOT*

Strengths	Opportunity
Controlled, Supportive	Standardization
Weakness: Small, Decreased Validity	Threats: Sustainability

The strengths for this particular environment were that it is small, controllable, the audience is ready and willing to learn and the faculty/administrators are supportive of change and growth. Weaknesses included the size of the class, in terms of impacting the validity of the tools used to measure significance. The smaller the sample, the less reliable the data, making subjective data more important but also giving way to high variability. Translating teamwork in-situ simulation into the concept-based curriculum which is state driven was an opportunity for great change should this project become adopted long term. Threats would be that the project would not be adopted long term given to high faculty turnover and lack of continued TeamSTEPPS© Master Training staff.

## Timeline

The process improvement capstone project was implemented over a three week period.

Figure 5 below shows the process from beginning to end.



*Figure 5.*Timeline for Project

## Budget

The resources needed for this project were cost neutral. Instructors are already engaged in class instruction and the in-situ simulation does not take away from these activities. TeamSTEPPS Master Training is free and available at Duke University bi-annually over a weekend; therefore, no lost work time is involved. All texts and materials were free for use and accessible from the Internet and in hardcopy from trainers, including DVDs and power point presentations.

There were no simulators used for in-situ simulation unless desired, so there were no additional costs for mannequins or elaborate machinery. Video equipment is optimal but optional. Therefore, the costs amounted to zero, except gas and personal expenditures and the resources were abundant. This makes the project an easy one to adapt to any culture, be that large or small.

## Instruments

The TeamSTEPPS Teamwork Attitude Questionnaire (T-TAQ) was designed to measure attitudes related to core components of teamwork. These components are leadership, mutual support, communication, situation monitoring, and team structure. The T-TAQ cannot be altered, as this will affect the reliability and validity of the instrument. The project coordinator did not alter the questionnaire. The tool can be used free of charge without permission due to federal funding.

The T-TAQ has been tested and researched for reliability over decades of use in both healthcare and non-healthcare industries. Table 3 and Table 4 both address the reliability and validity of the tool; each item was individually evaluated for significance and then tailored into a thirty-question survey. The tool requires no permission for use, as Team STEPPS© is a federally funded endeavor to improve safety and quality in healthcare.

Table 3

*T-TAQ Reliability Coefficients*

Construct	Number of Items	Cronbach's Alpha
Team Structure	6	.70
Leadership	6	.81
Situation Monitoring	6	.83
Mutual Support	6	.70
Communication	6	.74

*Note.* Reproduced from TeamSTEPPS

Table 4

*T-TAQ Construct Inter-Correlations*

Construct	Team Structure	Leadership	Situation Monitoring	Mutual Support	Communication
Team Structure	1.00	.572*	.617*	.356*	.533*
Leadership		1.00	.633*	.481*	.558*
Situation Monitoring			1.00	.541*	.627*
Communication				1.00	.589*
N	449	449	449	449	449

*Note.* \* $p < .01$ , two-tailed

The T-TAQ can be administered at any time, independently, as a TeamSteps site assessment or evaluation. In this case it was used as a project pre and post survey to determine the effect of in-situ simulation on team attitudes.

### **Data Collection**

Questionnaires were handed out by faculty support two weeks prior to project implementation in the educational setting. The rationale behind administering the T-TAQ in advance of project implementation was to determine need. The purpose of the capstone was to determine if in situ simulation had an impact on team attitude scores. A need was identified and thus the project moved forward. The T-TAQ was administered again the day of completion of the final simulation. The results of the pre survey will be discussed in the next chapter.

### **Data Analysis**

Data analysis was a limitation for this project. Sample size made it difficult to determine whether true significance could be evaluated. Since the project is a process improvement endeavor the benefit can be expressed qualitatively as well and student statements were considered when looking at the results. Sustainability is essential so the analysis is important so the Statistical Package for Social Sciences (SPSS) version 22 for Windows (SPSS Inc. Chicago, IL, USA) was utilized to obtain the statistical analysis of this process improvement capstone project.

Descriptive analysis of data using an independent sample t-test to determine and compare the overall mean scores and standard deviations was chosen as opposed to each category in the T-TAQ. The rationale behind this choice again was due to the limitation of sample size. Evaluating the mean scores pre and post proved to be more beneficial than individual categories.

### **Limitations**

A limitation to the project was identified to be small sample size. The process was not controlled and was quasi-experimental due to the benefits of the information given and the number of people involved. In situ simulation is a new concept for spontaneous learning and therefore little information is available regarding its use in education. The length of time was short. The project would have more reliability had it been performed over a course of months.



### **Summary**

Students are not adequately educated to formal teamwork principles. In situ simulation provides a means in which to increase the attitudes of students regarding teamwork principles. This capstone project sought to provide a sustainable, inexpensive way to address an issue that is being recognized nationally in healthcare and move students into the position of being satisfied when they enter the workforce.

## **CHAPTER IV**

### **Results**

Nursing students are not adequately prepared to work in a team environment, which can impact turnover and patient safety. The purpose of the capstone project was to increase attitudes toward teamwork in nursing students with the use of simulation. This capstone project sought to answer the following: Will In Situ Simulation result in an increased attitude toward teamwork attitudes in nursing students?

This project tested the effect of in-situ simulation on nursing students' attitudes related to teamwork and communication, by using a survey administered as a pre-test and posttest to intervention. Data included composite scores for the survey.

### **Sample Characteristics**

The sample obtained for this project was nursing students in rural northeast North Carolina. The participants were all over 18 years of age and able to read and write English without limitation. Demographics were not collected, racial and gender makeup was not deemed important by the project coordinator in order to respect complete anonymity. The project took place during a regularly scheduled class using content that was being taught for that day.

### **Major Findings**

The TeamSTEPPS© Teamwork Attitude Questionnaire (T-TAQ) was given to students pre and post simulation. This section will discuss some of the major findings. The T-TAQ is a 5-point Likert scale tool utilizing Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA).

Using Statistical Package for the Social Sciences (SPSS ®) for descriptive data analysis an evaluation of pre and post means of the T-TAQ demonstrate a movement

towards a more positive attitude of teamwork by nursing students after the use of in situ simulation. The standard Likert score was ranked from one to five with one being the most positive scoring and five being the least. Questions 20, 21, 24 and 30 were reversely coded in order to prevent subjects from selecting all positive choices and thus not pay attention to the questions being asked.

Table 5 indicates the mean for individual questions pre simulation with low numbers indicating a positive attitude on a scale of one to five. The overall sum illustrates a high number of 90 to a low of 18, with the lower numbers indicating the most positive attitudes.

Table 5

## Statistics Pre In Situ Simulation

Question #	N		Mean	Std. Deviation	Sum
	Valid	Missing			
1	18	0	2.2778	.57451	41.00
2	18	0	2.0000	.00000	36.00
3	18	0	3.3333	.97014	60.00
4	18	0	3.0000	1.02899	54.00
5	18	0	2.0000	.00000	36.00
6	18	0	3.1667	.92355	57.00
7	18	0	2.0000	.00000	36.00
8	18	0	2.8889	.83235	52.00
9	18	0	4.0000	.34300	72.00
10	18	0	1.0000	.00000	18.00
11	18	0	1.5000	.51450	27.00
12	18	0	1.5000	.51450	27.00
13	18	0	1.6667	.48507	30.00
14	18	0	2.0000	.59409	36.00
15	18	0	1.8889	.32338	34.00
16	18	0	2.8889	1.02262	52.00
17	18	0	2.1667	.92355	39.00
18	18	0	2.1111	.32338	38.00
19	18	0	2.3333	.84017	42.00
20	18	0	2.7222	1.36363	49.00
21	18	0	2.0000	.00000	36.00

22	18	0	1.8333	.70711	33.00
23	18	0	1.7778	.64676	32.00
24	18	0	2.4444	.98352	44.00
25	18	0	2.1111	.67640	38.00
26	18	0	2.1111	.67640	38.00
27	18	0	2.5000	1.04319	45.00
28	18	0	3.3333	.84017	60.00
29	18	0	2.0000	.00000	36.00
30	18	0	3.0000	1.02899	54.00

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The T-TAQ has five subdivisions illustrating different components of teamwork principles: team structure, leadership, situation monitoring, mutual support and communication. Table 6 illustrates the mean of each division pre in situ simulation. This is another way of calculating room for improvement and areas of weakness pre intervention.

Table 6

*Pre Teamwork Groupings*

Team Principle	Number	Mean	Standard Deviation	Sum
Team Structure	18	2.63	.58	47
Leadership	18	2.15	.37	39
Situation Monitoring	18	2.12	.61	38
Mutual Support	18	2.18	.84	39
Communication	18	2.5	.71	45

Table 7 indicates the mean for individual questions post simulation with low numbers indicating a positive attitude on a scale of one to five. The overall sum illustrates a high number of 90 to a low of 18, with the lower numbers indicating the most positive attitudes.

Table 7

*Statistics Post In Situ Simulation*

Question #	N		Mean	Std. Deviation	Sum
	Valid	Missing			
1	18	0	1.0000	.00000	18.00
2	18	0	1.5000	.51450	27.00
3	18	0	2.2222	.42779	40.00
4	18	0	1.5000	.51450	27.00
5	18	0	1.0000	.00000	18.00
6	18	0	2.1111	.47140	38.00
7	18	0	1.0000	.00000	18.00
8	18	0	2.1111	.67640	38.00
9	18	0	1.1111	.32338	20.00
10	18	0	1.0000	.00000	18.00
11	18	0	1.0000	.00000	18.00
12	18	0	1.0000	.00000	18.00
13	18	0	1.6667	.48507	30.00
14	18	0	1.6667	.48507	30.00
15	18	0	1.8889	.32338	34.00
16	18	0	1.5556	.51131	28.00
17	18	0	1.6111	.50163	29.00
18	18	0	1.8889	.32338	34.00
19	18	0	1.6667	.48507	30.00
20	18	0	1.7778	.54832	32.00
21	18	0	1.0000	.00000	18.00

22	18	0	1.8333	.70711	33.00
23	18	0	1.5000	.51450	27.00
24	18	0	1.2778	.46089	23.00
25	18	0	1.8333	.38348	33.00
26	18	0	1.5556	.51131	28.00
27	18	0	2.0000	.68599	36.00
28	18	0	1.6667	.48507	30.00
29	18	0	1.00	.00000	18.00
30	18	0	2.0000	.00000	36.00

---



Table 8 illustrates the mean of each division post in situ simulation. These results help to illustrate the impact of the simulation on teamwork attitudes. The low numbers indicate a more positive attitude as reflected by the Likert scale.

Table 8

*Post Teamwork Groupings*

Team Principle	Number	Mean	Standard Deviation	Sum
Team Structure	18	1.55	.32	28
Leadership	18	1.2	.17	22
Situation Monitoring	18	1.7	.43	31
Mutual Support	18	1.51	.45	27
Communication	18	1.7	.35	30

The overall T-TAQ scores had a significant increase ( $p < .05$ ) in teamwork attitude from pre to post test.

Figure 6 summarizes the Agree (A) responses from the T-TAQ since this is the area with the most responses and yet some area for improvement.

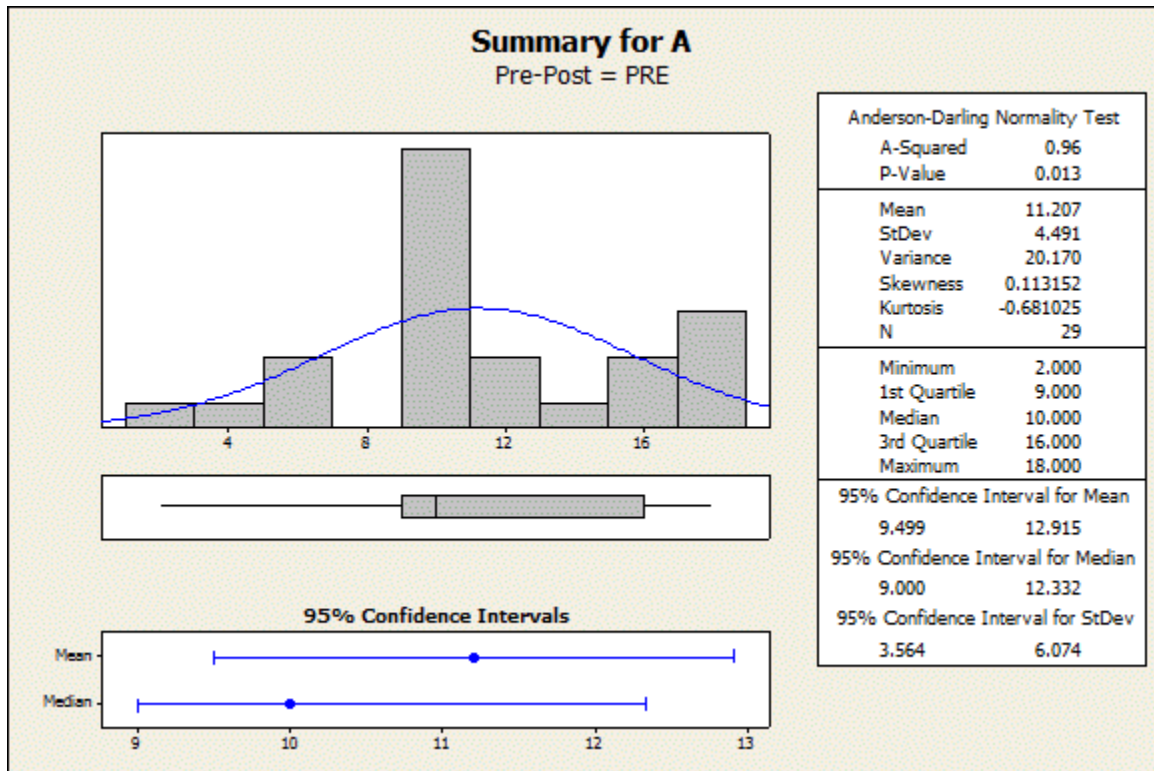


Figure 6. Pre Summary Agree

Figure 7 summarizes the same responses from the post T-TAQ. The mean remains relatively the same. The graphic shows that the distribution between pre and post (A) moves more towards the (SA) category.

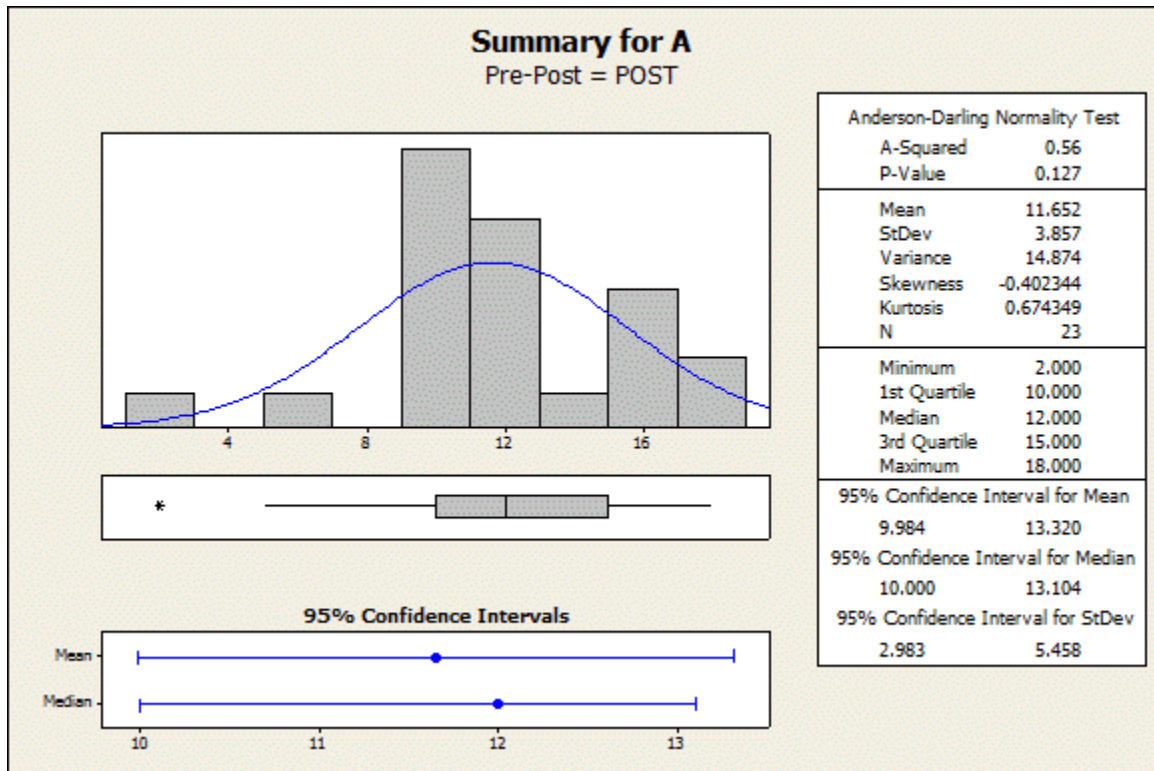


Figure 7. Post Summary Agree

Figure 8 depicts a pre simulation summary of the Strongly Agree (SA) category..

The mean for (SA) was 4.9 showing that few students chose (SA) pre simulation. The median was 3.

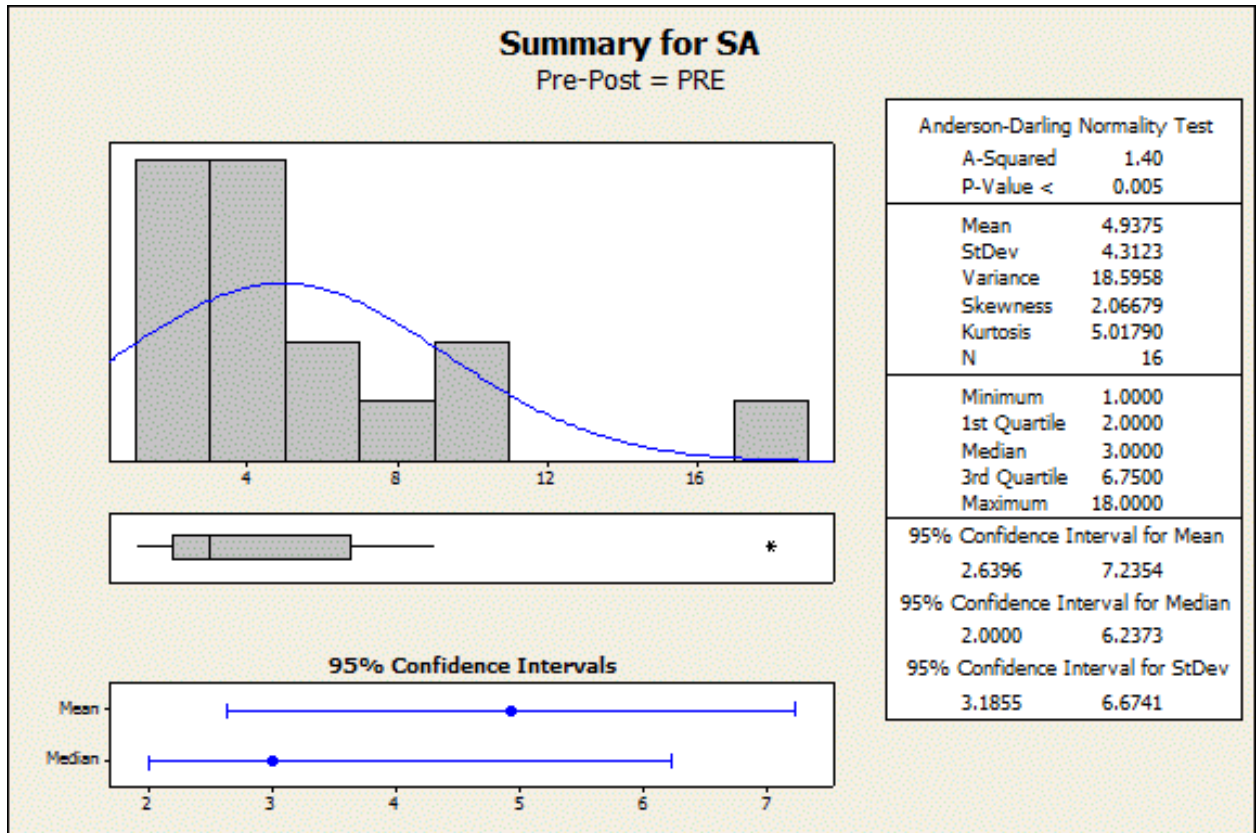


Figure 8. Pre Summary Strongly Agree

Figure 9, reflecting post in situ simulation, shows the median and mean increase, 9 and 8 respectively.

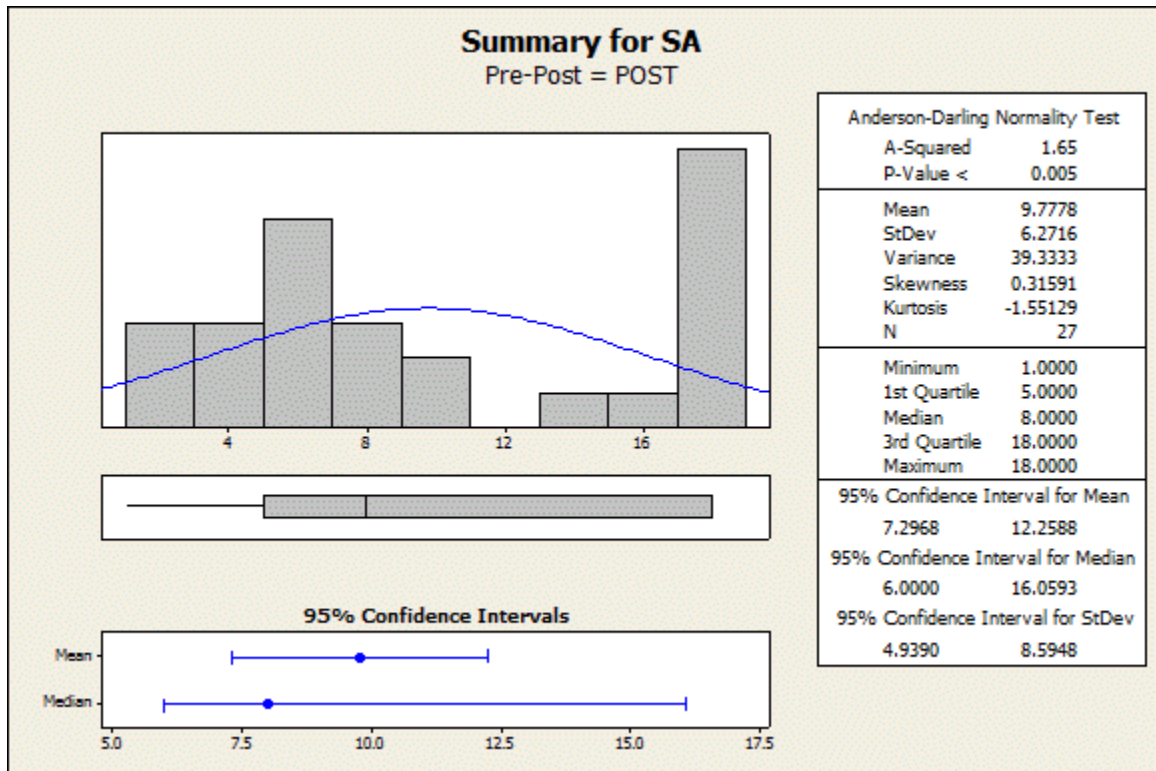


Figure 9. Post Summary Strongly Agree

Subjectively Table 9 addresses the differences between role activity during the in situ simulation specifically noting whether Situation, Background, Assessment, and Recommendation (SBAR) communication was utilized. The degree of assistance given was also noted.

Table 9

*In Situ Simulation Role Pre and Post Outcome*

Role	Simulation Description	Outcome PRE feedback Identified by the group	Outcome POST feedback Identified by the group
Patient	<ul style="list-style-type: none"> <li>Behave angrily and verbally lash out at staff</li> </ul>	<ul style="list-style-type: none"> <li>Behave angrily and verbally lash out at staff</li> </ul>	<ul style="list-style-type: none"> <li>Behave angrily and verbally lash out at staff</li> </ul>
Nursing Student	<ul style="list-style-type: none"> <li>Escalate with family member</li> <li>Be redirected when calmly approached</li> </ul>	<ul style="list-style-type: none"> <li>Escalate with family member</li> <li>Be redirected when calmly approached</li> </ul>	<ul style="list-style-type: none"> <li>Escalate with family member</li> <li>Be redirected when calmly approached</li> </ul>
Family Member	<ul style="list-style-type: none"> <li>Facilitate simulation</li> </ul>	<ul style="list-style-type: none"> <li>Facilitate</li> </ul>	<ul style="list-style-type: none"> <li>Facilitate</li> </ul>
Project Coordinator	<ul style="list-style-type: none"> <li>Continue simulation experience when SBAR not used.</li> </ul>	<ul style="list-style-type: none"> <li>Continue simulation experience when SBAR not used</li> </ul>	<ul style="list-style-type: none"> <li>Continue simulation experience when SBAR not used</li> </ul>
Nurse 1	<ul style="list-style-type: none"> <li>Take Leadership Role</li> </ul>	<ul style="list-style-type: none"> <li>Did not take Leadership Role</li> </ul>	<ul style="list-style-type: none"> <li>Did Identify self as primary nurse</li> </ul>
Nursing Student	<ul style="list-style-type: none"> <li>Use SBAR with other personnel</li> <li>Call for assistance</li> </ul>	<ul style="list-style-type: none"> <li>Did not use SBAR</li> <li>Did not call for assistance</li> </ul>	<ul style="list-style-type: none"> <li>Did use SBAR consistently</li> <li>Did call for assistance</li> </ul>
Nurse 2	<ul style="list-style-type: none"> <li>Assist Leader</li> </ul>	<ul style="list-style-type: none"> <li>Did not assist leader took over role</li> </ul>	<ul style="list-style-type: none"> <li>Assisted leader</li> </ul>
Nursing Student	<ul style="list-style-type: none"> <li>Use SBAR</li> <li>Call for Assistance</li> </ul>	<ul style="list-style-type: none"> <li>Did not use SBAR</li> <li>Deescalated family and called for assistance with family</li> </ul>	<ul style="list-style-type: none"> <li>Used SBAR</li> <li>Deescalated family and called for assistance</li> </ul>
Nurse Aide Nursing Student	<ul style="list-style-type: none"> <li>Assist Leader</li> <li>Use SBAR</li> </ul>	<ul style="list-style-type: none"> <li>Assumed leader role</li> <li>Did not use SBAR</li> </ul>	<ul style="list-style-type: none"> <li>Assist Leader</li> <li>Use SBAR</li> </ul>
Safety Officer Nursing Student	<ul style="list-style-type: none"> <li>Assist Leader</li> </ul>	<ul style="list-style-type: none"> <li>Did nothing</li> </ul>	<ul style="list-style-type: none"> <li>Assisted Leader with family member</li> </ul>

### **Summary**

The question posed by the project was whether in situ simulation would have a positive effect on teamwork attitudes as indicated on pre and post T-TAQ. The results showed a movement in both p values and mean toward (A) and (SA) respectively. The overall means and sums of each category are reduced indicating a positive movement of attitude. The appearance is that no (D) or (SD) was scored post simulation.



## **CHAPTER V**

### **Discussion**

Nursing students are not adequately prepared on formal teamwork principles, which may make them vulnerable when entering the workforce. The purpose of this capstone project was to have a positive impact on teamwork attitudes with the use of in situ simulation. The TeamSTEPPS © Team Attitude Questionnaire (T-TAQ) was given pre and post in situ simulation in order to measure if there were any changes in attitude as it pertains to teamwork

### **Implications of Findings**

Based on previous research the evidence indicated that in situ simulation increased positive attitudes towards teamwork. This increased teamwork thus increasing safety and quality of care to patients. In this capstone project the T-TAQ was administered and with the use of SPSS, the data was analyzed using basic descriptive methods. The pre and post T-TAQ indicated a change of over 95 percent towards more positive attitudes. The total mean decreased overall from highs of 2.6 to lows of 1.2. A lower the mean score indicated a more positive attitude of the student towards teamwork. The movement of these numbers implicated that in situ simulation does have an effect on increasing attitudes regarding teamwork when teamwork principles are applied.

### **Teamwork Principles**

Specifically addressing the five teamwork principles measured in the T-TAQ, clarity is provided for which areas showed the most marked improvement from in situ simulation. Mutual Support and Team Structure showed reduction of almost half from pre to post simulation. Highlighting teamwork within the simulation could be the rationale behind this increase in attitude. Communication and situation monitoring are

concepts that can be grasped without the actual constructs of a team; mutual support and team structure lend themselves to the necessity of demonstration. The mean for team structure moved from 2.63 and a total score of 47 to a mean of 1.55 and total score of 28. The mean for mutual support moved from 2.18 with a total sum of 39 to a mean of 1.51 and a total sum of 27. Leadership also moved down markedly indicating that in situ simulation assists with the identification of the leader. Subjectively students were able to identify the need of the leader during debriefing and showed improvement of delegation after the second simulation was performed. Student statements that it was “easier to identify who was in charge” and that it was “more organized” led the project coordinator to believe the simulation had a positive impact. One student commented that, “this all makes sense now. I understand how I am supposed to communicate.”

#### Situation, Background, Assessment, and Recommendations (SBAR)

communication was not utilized during any of the first simulation. After feedback from the group and identification of non-use by the group, SBAR was used 100% of the time. Qualitatively the “team leader” who played the primary nurse stated the immediate feedback helped her remember to use it. This implicates, as does the literature review, that in situ simulation can have immediate if not long-term results.

Subjectively the students appeared engaged, talkative and willing to give feedback. The in situ simulation was voted by hands to benefit their learning of SBAR and teamwork principles. The students voiced liking the immediate feedback regarding “did wells”, and “could have been done better”. Two students voiced after the class that they would “like to do more of this...” All students voiced the activity was beneficial to learning.

### **Application to Theoretical Framework**

King (1986) described by using a conceptual model how systems interact with each other. Taking that systems' model and breaking it down into subsets of the individual, groups and society she developed the Theory of Goal Attainment. Implications of this project are that conversing about King in relation to teamwork is very easy to do because the language is so similar.

TeamSTEPPS© uses communication, team structure, mutual support, leadership, and situation awareness to describe how effective teams function. King (1986) describes teamwork, mutual goal setting, and reaction to describe how goals are achieved amongst individuals and groups, even society as a whole. The key is mutually agreed upon goals.

Applying Goal Attainment Theory into what transpired in the in situ simulation one must take into consideration SBAR. In the first simulation the students did not agree to the “goal” of communicating in SBAR format even though the project coordinator declared that as an objective. After feedback from their peers, SBAR became the discussion prior to the next in situ simulation. Agreement was obtained and SBAR was used 100% of the time. A case could be made that goals need to be mutually agreeable to be accomplished. Goals imposed by an authority figure were not accomplished.

Mutual support is a TeamSTEPPS© principle which also was demonstrated when the class as well as the simulation participants assisted each other in remembering what needed to be accomplished and also what went well. The Theory of Goal Attainment simply calls this feedback and this was demonstrated effectively in both the simulation and the debriefings.

### **Limitations**

Although the overall findings for this project indicated enough of a change in attitude to continue sustainment of the project there are some barriers to explore. For example, the students were aware that teamwork attitudes were being evaluated and could have been inclined to positively interact with the project coordinator to please their instructor or the coordinator. The survey itself being administered pre and post simulation lends itself to some skewing because the more positive answers are easily recognized. If the aims of the students are to please or rate their level of enjoyment a more positive score could be obtained.

### **Implications for Nursing**

Nursing students are not adequately trained in teamwork principles. In situ simulation uses the spontaneity of the moment to enforce principles that need to be addressed. The simulations are high fidelity, and inexpensive therefore there is little risk to using the strategy to increase learning and compliance regarding any issue that students are addressing at the time.

Nursing, as a discipline, is relatively new to the idea of in situ simulation, but research has shown that the use of this form of simulation in the clinical area provides immediate results that save lives and prevent errors. The only risk is to have those improperly trained starting the process. TeamSTEPPS<sup>©</sup> as well as other programs, provide free training due to the national importance to address patient safety and quality of care.

Nursing as a profession has little research that applies to this area. The medical profession has taken the steering wheel of this large issue. Nurses need to be the

forerunners of research that will impact the way the workforce is utilized. Nurse educators need to realize that students are becoming frustrated and dissatisfied early in their careers and begin to apply these practices in the curricula.

The workforce is dwindling in the profession of nursing and this impacts patient care. The nursing shortage will be increasing in the clinical setting, and will worsen an already suffering nursing faculty shortage. The profession should embrace methods that will increase nurse job satisfaction, build confidence in nurses, and increase the quality of care that is delivered to patients.

### **Recommendations**

Based on the data, both quantitative and qualitative, the project coordinator recommended that the in situ simulation becomes a process that is adopted in day-to-day classroom activities at colleges and universities. The findings show enough of an increase in team attitudes that the benefit is worth the risks. The risks are negligible as the costs of the project and time needed to implement are minor. Educators may argue that one more thing will take away from the knowledge that needs to be presented in an already tight curriculum; however this strategy only adds to learning. It does not require additional learning. These principles are endorsed by the Quality and Safety Education for Nurses (QSEN), Joint Commission, Institute of Medicine, and World Health Organization. Using these tools will only prepare students for practice and help them be successful for The National Council Licensure Examination (NCLEX-RN® exam).

## **Conclusion**

In conclusion, in situ simulation proved to be of benefit in increasing teamwork attitudes in nursing students. Students need to have formal teamwork training to be successful in the work place and continue on in a profession that needs them. The project had limitations, such as class size and variables that could affect validity, but the costs of the benefits outweigh these limitations. The students found the process to be enjoyable and increased their learning. Hopefully the college will continue this process and recommend its use throughout the college system.

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