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Effects of an Interprofessional Simulation Activity to Improve Students' Perceptions of Other Healthcare Professions

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EFFECTS OF AN INTERPROFESSIONAL SIMULATION ACTIVITY TO IMPROVE STUDENTS' PERCEPTIONS OF OTHER HEALTHCARE PROFESSIONS

by

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ABSTRACT

EFFECTS OF AN INTERPROFESSIONAL SIMULATION ACTIVITY TO IMPROVE STUDENTS' PERCEPTIONS OF OTHER HEALTHCARE PROFESSIONS

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Healthcare professionals have historically been educated and trained by members of their own profession within a curriculum that reinforces their individual discipline-specific strengths. This differentiation has contributed to students having little interaction with other professionals until after they have entered the workforce and consequently little formal education in collaboration or integration. The purpose of this mixed-method study was to evaluate the impact of an interprofessional (IP) collaborative activity on student's perceptions of the others discipline for the improvement in care of medical patients.

The sample population consisted of students from two programs, nursing (n=40) and respiratory therapy (n=33). Students were prepared prior to the IP activity on the content and psychomotor aspects of their individual health care competencies. Mannequins of moderate fidelity were used to enable each participant to perform discipline specific procedures during the course of a trauma simulation. After viewing an introductory video, participants were instructed to assist and educate the other member during the critical components of the scenario on their respective procedures. A modified Interdisciplinary Education Perception Scale (IEPS), adapted with permission, was administered one week prior to and immediately after the simulation activity. The IEPS uses four subscales to assess individual's perception of competency and autonomy, perceived need for cooperation, perception of cooperation, and understanding the value

of others. Pre- and post-test scores on the IEPS sub-scales were analyzed with univariate, repeated measures two-way Analysis of Variance (ANOVA). Main effects for profession and time (2x2), as well as interactions, were tested on each sub-scale. In addition, a qualitative content analysis based on the open-ended questionnaire was performed on all subjects.

There was a significant change in all four subset scores following the IP activity when investigating the main effect of time. Neither effect of profession or interaction within any of the four subscales reached statistical significance. Qualitative analysis of participant questionnaires supported the quantitative findings that the simulation experience was effective in promoting positive change in the participants' perceptions.

This study demonstrated an effective method to increase students' perceptions of attributes found in effective clinical teams. Healthcare educators should incorporate structured, interprofessional (IP) simulation activities within their curricular programs to improve competency, cooperation, and value placed on other health care professions.

DEDICATION

> Of all the creatures on earth, only human beings can change their patterns. Man alone is the architect of his destiny... Human beings, by changing the inner attitudes of their minds, can change the outer aspects of their lives.
>
> ~William James

As a first generation college student, I am humbled by the ability to be educated in the manner that I am. In that light, I dedicate this to my grandfather, Karl Poulsen, a first generation Danish immigrant who never completed the U.S. equivalent of elementary school before leaving for maritime duty. Although lacking in formalized degrees, it did not diminish his intelligence or determination.

"Tak for alt grandfather, du er gået glip af dyrt."

This research is also for my wife Amy and children Seth, Avery, and CJ. May the time taken to accomplish this degree benefit all of you as much as it has me. I love you all.

~Chase R. Poulsen

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If your ship doesn't come in, swim out to it.

~Jonathan Winters

This body of work would not have been possible without the direction offered by Dr. John M. Ritz. I acknowledge your dedication to your students and your profession and have a deep appreciation for your patience.

I also acknowledge Jefferson College of Health Sciences and Carilion Clinic. This degree would have been tremendously difficult without the generous support of the institution's finances and the intellectual abilities contained within its faculty and practitioners. I am grateful.

~Chase R. Poulsen

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CHAPTER I

INTRODUCTION

The population over sixty-five years old within the United States has increased from 34,991,751 in 2000 to 40,267,948 by 2010 (U.S. Census Bureau, 2011). This demographic represents a disproportional 15.1% change when compared to the 9.7% overall increase in total population. The comparison becomes even more pronounced within most demographic subgroups (Table 1). This population trend is reiterated within developed countries throughout the world (Palangkaraya & Yong, 2009). It has long been reported that healthcare costs increase proportionally with age and proximity to death (Beekman, 2005; Zweifel, Felder, & Werblow, 2004). Future costs and available care will be compounded by the Sisyphus syndrome—increased health expenditures lead to increased longevity which in turn leads to an increase in healthcare demand (Zweifel, Steinmann, & Eugster, 2005). These factors have profound implications for the healthcare industry. The U.S. Bureau of Labor Statistics projects a needed increase of 22 to 34% in healthcare providers within the next decade (Miller, 2011). The European Union anticipates that 13.5% of necessary care will not be provided unless healthcare workforce inadequacies are addressed (Villanueva, 2010). National populations need quality medical delivery systems that are efficient enough to withstand these factors. Interprofessional and collaborative care have been identified as key components to improve quality while decreasing costs associated with healthcare (Correia, 2011).

Interprofessional (IP) collaboration is imperative for quality, cost-efficient patient care. Mitchell, Parker, Giles, and White (2010) demonstrated that IP approaches to healthcare have been linked to improved planning and policy development, more

Table 1

Population 65 Years and Older by Age and Gender: 2000 and 2010

Gender and Age	2000 Number	2010 Number	Change, 2000 to 2010 Number	Change, 2000 to 2010 Percentage
Both genders, all ages.	**281,421,906**	**308,745,538**	**27,323,632**	**9.7**
65 years and over.....	34,991,753	40,267,984	5,276,231	15.1
65 to 74 years.....	18,390,986	21,713,429	3,322,443	18.1
65 to 69 years.....	9,533,545	12,435,263	2,901,718	30.4
70 to 74 years.....	8,857,441	9,278,166	420,725	4.7
75 to 84 years.....	12,361,180	13,061,122	699,942	5.7
75 to 79 years.....	7,415,813	7,317,795	–98,018	–1.3
80 to 84 years.....	4,945,367	5,743,327	797,960	16.1
85 to 94 years.....	3,902,349	5,068,825	1,166,476	29.9
85 to 89 years.....	2,789,818	3,620,459	830,641	29.8
90 to 94 years.....	1,112,531	1,448,366	335,835	30.2
95 years and over.....	337,238	424,608	87,370	25.9
95 to 99 years.....	286,784	371,244	84,460	29.5
100 years and over.....	50,454	53,364	2,910	5.8

Note. From: "The older population: 2010 census briefs" by U.S. Census Bureau, Department of Commerce, Economics and Statistics Administration, 2011. Adapted with permission of the author.

clinically-effective services, and enhanced problem solving. Rice et al. (2010) reported poor IP collaboration to negatively affect the delivery of health services, patient care, and costs. Experience with collaboration between different health care professions has historically occurred within clinical sites after graduation. Education with collaboration and integration must begin earlier in an individual's career. Students within different medical disciplines have traditionally had few opportunities to use acquired skills with other professions prior to employment and hence had little practice working in a collaborative manner. Interprofessional education within allied health professions is a relatively new development in historically compartmentalized programmatic designs

(Rye & Shelledy, 2011). Recent literature (Blue, Zoller, Stratton, Elam, & Gilbert, 2010; Reeves et al., 2009) suggests this practice is beginning to gain momentum in the pre-employment setting, and many types of implementation and evaluation of IP education are evolving. However, no single method of professional integration has demonstrated clear superiority and limited data exists on its effect on student perceptions, especially within certain professions (Zwarenstein, Reeves, & Goldman, 2009; Rye & Shelledy, 2011).

Healthcare organizations have identified the upwardly spiraling costs of care, safety, and efficiency as factors that can negatively affect their institutions' ability to deliver effective care (Correia, 2011). Organizations are investing resources to ensure their workforce is capable of addressing these negative influences. New graduates need to fulfill the expectations of employers, patients, and colleagues by entering the professional realm with a deep understanding of the importance of collaborative care. Preparation of these graduates is a key issue in addressing future healthcare needs.

Statement of Problem

The purpose of this study is to determine the perceived value of interprofessional training for the improved treatment of medical patients. This study is important to demonstrate the effectiveness of collaborative interprofessional activities within healthcare programs. Engaging students in highly structured interdisciplinary experiences may improve their understanding of the abilities of different practitioners, change perceptions of their own and others' fields, and result in improved patient care using IP strategies. Results of this study may justify embedding IP activities within health care

institutions or guide instructors and administrators in modifying existing training methods.

Research Questions

The researcher investigated students' perceptions of competency within their discipline, perceived need to cooperate, perception of actual cooperation, and the perception of other medical professions value before and after an interprofessional educational experience. The researcher believed that structured interaction would change these perceptions and enable students to develop and deploy skills in a team-based approach to patient care. The intent was to introduce and/or challenge their perceptions during the activity and evaluate those changes based upon students' attitudes.

This study was guided by the following research questions:

RQ_1: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the competency of their own discipline?

RQ_2: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their need to cooperate with the other medical discipline in providing enhanced health care?

RQ_3: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their actual cooperation with the other medical discipline?

RQ_4: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the value of the other medical discipline?

Background and Significance

National and international bodies such as the Institute of Medicine and the World Health Organization have emphasized the need for healthcare professionals to work in interprofessional teams in order to improve quality and safety within the medical field (Baker et al., 2008). As noted earlier, the aging population, demographic subgroup comparison, and Sisyphus syndrome (Table 2) should challenge the efficiency, safety, and financial security of the current healthcare industry. An integrated approach to patient care is needed to improve quality while decreasing costs associated with health care (Correia, 2011). Experience with collaboration between different professions occurs within clinical sites after graduation. These experiences and attitudes must be embedded early within medical educational systems to prepare tomorrow's healthcare workforce.

Individuals within healthcare professions have historically been educated and trained by members of their own profession and within a curriculum that shapes their discipline specific strengths. Although this method has been shown to be very effective in developing skilled practitioners, it often results in students having little interaction with other specialty areas until after they enter the workforce, and consequently, little formal education in collaboration or integration. It is predicted that the length of time spent within discipline specific programs further isolates individual professions into their component specialties. This individualized focus during formal education makes the transition to an interactive professional difficult, leading to less efficient patient practices (Rice et al., 2010). When IP skills can be incorporated within teams composed of different disciplines, efficiency should increase (Parker, Giles, & White, 2010).

Table 2

Example of the Sisyphus Syndrome, Population 65 Years and Older in Skilled-Nursing Facilities by Selected Age Groups and Gender: 2010

Gender and Age	Total Population	In Skilled-Nursing Facilities	
		Number	Percent
Both genders, all ages.	308,745,538	1,502,264	0.5
Total 65 years and over.	40,267,984	1,252,635	3.1
65 to 74 years.	21,713,429	197,310	0.9
75 to 84 years.	13,061,122	420,790	3.2
85 to 94 years.	5,068,825	529,689	10.4
95 years and over.	424,608	104,846	24.7
95 to 99 years.	371,244	87,621	23.6
100 years and over.	53,364	17,225	32.3

Note. From: "The older population: 2010 census briefs" by U.S. Census Bureau, Department of Commerce, Economics and Statistics Administration, 2011. Adapted with permission of the author.

Educational systems need to examine their delivery of content and pedagogy and integrate various medical professions through training prior to their emergence into the workforce. Colleges and universities responsible for preparing healthcare professionals can assume a primary role addressing deficits in healthcare quality. According to Greiner and Knebel (2003) all health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches, and informatics. This call to prepare healthcare professionals to work as interdisciplinary teams was founded in a recognition that the American healthcare system is in crisis. Greiner and Knebel (2003) cite the increasing number of people impacted by medical errors, dissatisfaction with the availability and effectiveness of care, and unsafe working conditions for providers as examples of major

challenges affecting the quality and costs of healthcare. These challenges can only be met by a large component of the workforce that is prepared and willing to work together.

High levels of coordination and collaboration are needed across all medical disciplines if the current healthcare workforce is going to meet the expected need for quality care of patients in the future (Oandasan & Reeves, 2005). However, most studies and literature within interdisciplinary medical education focus on two dominant health fields, medicine and nursing. Nearly all studies to date lack the involvement of key providers within their subject groups. Respiratory therapists are one such provider. These therapists work side-by-side with doctors, nurses, and other professionals delivering patient care in diverse settings and are members of most internal Rapid Response Teams (RRT) (Myers, 2001; Jones, DeVita, & Bellomo, 2011). The RRT is comprised primarily of nurses and respiratory therapists and provide a successful clinical example of interprofessional teamwork. The RRT is activated when a critically-ill patient presents with predefined critical symptoms such as angina, shortness of breath, or unresponsiveness. They respond to a patient area with "the necessary skills and equipment to rapidly assess and treat the deteriorating patient" (Jones, DeVita, & Bellomo, 2011, p. 139). RRTs have been shown to be effective in reducing cardiac arrest and patient mortality (Butner, 2011) and improving patient care (Williams, Newman, Jones, & Woodard, 2011). However, their collaboration has been developed within the work setting, rather than in an educational institution preparing health care providers.

Professionals within the field of respiratory therapy have called for increased IP research and education. Rye and Shelledy (2011) conducted an international survey of

program directors within accredited respiratory therapy programs (Figure 1) regarding their use of IP education within current curricular designs. Only 28% of responding directors stated that they currently involve students within IP training contrasting the educators' belief that IP education is needed (98%), and it is beneficial to patient care (100%). Table 3 reflects respiratory therapy program directors attitudes towards IP education.

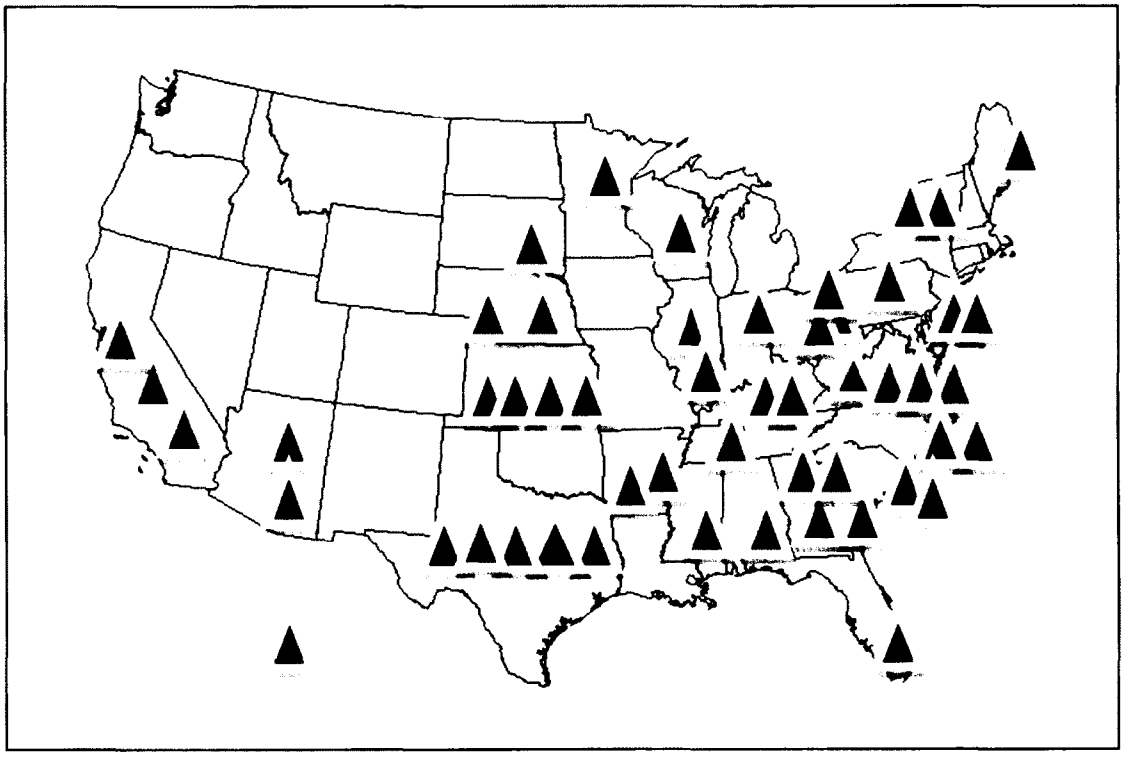

Figure 1. Locations of responding respiratory therapy program directors. Approximately 26% (52 of 202) of program directors responded to the survey. From "Utilization of interdisciplinary education in respiratory care curricula," by K. Rye and D. Shelledy, 2011, *Respiratory Care Education Annual, 20*, p. 3. Reprinted with permission of the author.

Table 3

Extent of Agreement or Disagreement about InterProfessional Education (IPE)

Statements	Level of Agreement				
	SA	A	D	SD	NA
I am knowledgeable about IPE.	9	30	13		
I have a positive attitude toward IPE.	21	30			1
I believe IPE is (or would be) beneficial.	21	30			1
I believe interdisciplinary education is needed.	17	32	1		2
I have the skills needed to implement IPE.	8	28	14		2
I have the resources needed to implement IPE.	5	19	22	3	3
I have taken steps to implement IPE.	4	24	19	1	4

Note. SA =Strongly Agree; A=Agree; D=Disagree; SD=Strongly Disagree; N/A=Not Applicable. Adapted from "Utilization of interdisciplinary education in respiratory care curricula" by K. Rye and D. Shelledy, 2011. Adapted with permission of the author.

IP education and related activities are a relatively new concept within the "compartmentalized, silo-like structures" of allied heath curriculum (Rye & Shelledy, 2011, p. 2). Current literature does not include vital members of the healthcare team, and few studies investigated changes in participants' perceptions after IP training. This study will expand upon knowledge within the IP domain and include participants from respiratory therapy, an underrepresented profession within related research.

Limitations

The following limitations existed for this study:

1. A single simulation laboratory within a southwestern Virginia college was used as the location of the training.

2. The study's population were students within the Associates in Applied Science for Respiratory Therapy program (n=33) and the Baccalaureate of Nursing program (n=40) within a single semester at a southwestern Virginia college.

3. The training was initiated through an introductory video where participants were introduced to the simulation environment. The introduction for the training was developed, produced, and videoed by faculty at a single southwestern Virginia college. The content presented followed national guidelines and was agreed upon by four masters and doctorial prepared faculty within the respiratory therapy and nursing programs.

Assumptions

Throughout the acquisition and collection of data for this study, the following assumptions were made and considered true:

1. All students were familiar with and had working experiences in their respiratory therapy and nursing specific content performed within the training.
2. Students were not content experts within the collaborating students' domain.
3. Students did not have irreversible preconceived notions of the collaborating students' profession.
4. Increased perceptions of self competency, perceived need to cooperate, actual cooperation, and value placed on other professions positively effects IP practice and patient care.

Procedures

The purpose of this study was to determine the perceived value of interprofessional training for the improved treatment of medical patients. For the purpose of this study, interdisciplinary training was defined as two or more professions learning with, from, and about each other to improve collaboration and the quality of patient care

(Barr, 2003). The study focused on the perceptions of students within two different medical professions prior to and after a single unit of instruction. The activity served as a medium to deliver a patient-based scenario to the participants. Medical simulation has been used to prepare students in a controlled environment prior to clinical implantation and is considered a safe and reliable arena (Reese, Jefferies, & Engstom, 2010). Students were prepared prior to the IP activity on the content and psychomotor skills of their individual medical competencies. Mannequins of moderate fidelity were used to enable each participant to perform discipline specific procedures during the course of a trauma simulation. After viewing an introductory video, participants were instructed to assist and educate the other team members on their respective medical treatments and procedures.

The research population consisted of students from a single southwestern Virginia healthcare college (N =97). The population consisted of students enrolled within the second year of an Associates in Applied Science for Respiratory Therapy program (N_1=37) and the fourth year of a Baccalaureate of Nursing program (N_2=60). Due to the low number of students enrolled within these two programs, every student that consented was enrolled within the study.

A modified Interdisciplnary Education Perception Scale (IEPS), adapted with permission from McFadyen, Maclaren, and Webster (2007), was administered one week prior to and immediately after the training. The IEPS uses four subscales to assess individuals' perception of competency, perceived need for cooperation, perception of cooperation, and the value placed on the other profession. Additionally, the survey deployed after the IP experience included two open-ended survey questions. The surveys

were coded and recorded with no identifying information, and the responses were kept confidential and secured according to the Internal Review Board of the hosting institution.

Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, such as number, mean, frequency, and range, were used to analyze demographic information of the sample populations. Pre- and post-test scores on the IEPS sub-scales were analyzed with univariate, repeated measures two-way Analysis of Variance (ANOVA). Main effects for profession and change (2x2), as well as interactions were tested on each sub-scale. Statistical significance level was set at a minimum of 0.05 for this study. A content analysis of the qualitative aspects of the post-survey questions was analyzed for reoccurring themes. These themes were listed by frequency and direction (negative or positive) cumulatively and by individual group in a manner consistent with qualitative inquiry (Creswell, 2007). The qualitative data were then used to reinforce and give depth to the quantitative measures.

Definition of Terms

The following terms and definitions will aid the reader in comprehending this study:

Best practices – a term used within the health care professions referring to therapies or procedures proven to improve patient outcomes leading to evidence based medicine.

Collaborative practice – an interprofessional process of communication and decision making that enables providers to synergistically influence the outcome of the patient.

Interprofessional education – when members (or students) of two or more professions learn with, from, and about one another to improve collaboration and the quality of care (Hammick, Freeth, Koppel, Reeves, & Barr, 2007).

Interdisciplinary education – for the purpose of this study, this term will be used interchangeably with interprofessional education.

Group theory – a theory which maintains that an individual's behavior is shaped by the group of which he/she is striving to become a member (Huntington, 1957).

Multiprofessional education – occasions when two or more professions learn side-by-side (Hammick, Freeth, Koppel, Reeves, & Barr, 2007).

Patient centered care – a philosophy of integrated medicine placing the individual receiving treatment above all other variables.

Rapid Response Teams (RRT) – teams of healthcare professionals with the necessary skills and equipment that deploy within a hospital to rapidly assess and treat the deteriorating patient (Jones, DeVita, & Bellomo, 2011).

Sisyphus syndrome – a modern theory describing increased health expenditures leading to increased longevity which in turn leads to an increase in healthcare demand (Zweifel, Steinmann, & Eugster, 2005).

Summary and Overview

Many factors are challenging current healthcare systems. One of the most pronounced factors is the disproportionate increase in older populations needing or receiving care. This issue is compounded by the expected longevity of this population and will greatly affect the associated costs of medical delivery systems. New methods of integration in healthcare professions may be used to partially solve some of these current

challenges. IP teams have been shown to improve care and decrease costs; however their implementation is largely related to clinical practice (Myers, 2001; Jones, DeVita, & Bellomo, 2011). Recent literature (Blue, Zoller, Stratton, Elam, & Gilbert, 2010; Reeves et al., 2009) suggests implementing collaborative activities early between different professions could be used to better prepare healthcare workers for clinical practice. Many key disciplines, including respiratory therapy have not been included within subject groups. Additionally, most research does not focus on the perceptual changes towards other specific disciplines after participating in collaborative activities. This study will expand knowledge within the IP domain and report on a profession that has yet to be included within related training and research.

Chapter II reviews the literature needed to give background and significance to this study. It reviews related literature pertinent to answering the research questions. The literature review will extensively support the relationship of the defined variables. This chapter reviews (a) history and development of IP education, (b) theories of integration and collaboration, (c) models of learning, (d) self-competency, (e) social cooperation, (f) value of non-self entities, (g) barriers to deployment of IP activities, and (h) proposed curricular models. Although broad in scope, this review will not thoroughly evaluate all of these variables within the study. It is of utmost importance, however, to understand the interrelationship and integration of these components to relate the effects of the findings.

Chapter III describes the methods and procedures used to collect and analyze the data. It overviews demographic information related to the study sample, research

variables, and instrument used for answering the research questions. The chapter concludes with the planned method for statistical analysis and summary.

Chapter IV reports the findings of the research study delivered in a format to answer the research questions. Tables are used to present the information visually and are supported by corresponding text.

Chapter V summarizes the content within the first four components of this dissertation. It outlines the researcher's conclusions and recommendations based upon the results of the study. These recommendations are separated for students and practitioners of the participating disciplines, educators, and future researchers.

CHAPTER II

REVIEW OF LITERATURE

Future generations of healthcare providers will need to deliver coordinated, team-based care to improve patient outcomes and efficiency. Currently, most providers interact and develop interprofessional relationships in the clinical arena after their discipline specific instruction. This requires significant employer resources to develop the needed cooperative attributes among staff members. Professional compartmentalization begins within the educational setting and is inadequate if future healthcare needs are to be met. The disproportional demographic within the population and subgroup comparison (U.S. Census Bureau, 2010), combined with the Sisyphus syndrome (Zweifel, Steinmann, & Eugster, 2005), and knowledge that healthcare costs increase proportionally with age and proximity to death (Beekman, 2005; Zweifel, Felder, & Werblow, 2004), will strain the current healthcare model. Hospital administrators have identified these factors and are investing time and money to promote a modern workforce efficient in collaborative care (Correia, 2011). This modernization stems from an acknowledgment that interprofessional (IP) collaboration is directly related to positive financial and clinical outcomes (Mitchell, Parker, Giles, & White, 2010; Rice et al., 2010). Additionally, a call to improve quality and patient safety through interprofessional care has been issued from regulatory bodies such as the Institute of Medicine and the World Health Organization (Baker et al., 2008). Although delivery of IP practice is starting to emerge in the pre-employment setting, no single design has emerged as clearly superior (Rye & Shelledy, 2011; Zwarenstein, Reeves, & Goldman, 2009). Additionally, data collected were limited in scope to certain disciplines, and few

studies investigated the effect of collaborative activities on student perceptions of different fields.

This chapter overviews the history and development of IP education, and it explores theories of integration, collaboration, and models of learning. The chapter focuses on attributes of self-competency, social cooperation, and the value of non-self entities. Possible structuring of curricular models and barriers to initiation of IP activities will be addressed. Through this focused review, the reader will gain an appreciation of the history, development, and current deployment of IP education and realize its importance for future healthcare generations.

History and Development of IP Education

Specialization within specific trades proved essential for societal improvement from early in human history (Trigger, 1998). Individual development and competency within domain-specific realms brought forth improvement in all sectors. This specification was necessary for concentrated study, and it led to dramatic innovations (Trigger, 1998). The ability to focus on specific domains in all disciplines, including medicine, led to "the path from past darkness to modern scientific enlightenment..." (Magner, 2005, p. 4). As these professions narrowed their scope of practice to more specific concentrated studies, integration with other professions lessened. This in turn led to content experts within certain arenas unaware of the knowledge and abilities of other disciplines until future interaction. This continues to be the case in the medical fields. Barr (2005, p. 10) interviewed senior physicians within different branches of medicine and reported that "time and energy is necessarily absorbed in the maintenance of working

relations between branches of medicine to the detriment of relations with other professions."

Within the medical and related fields, professional compartmentalization was developed over years of educational delivery and advancement within each field. By the 17th century, university scholars had begun the quest to assess, diagnose, and treat organ-specific ailments, causing a focused study into each system (Magner, 2005). System-specific curricular models ensued, and educational isolation from other professions followed. Other healthcare professions have similar educational backgrounds. The nursing profession traces its origins back to the early 15th and 16th centuries, and it developed specific curricular models in the early half of the 19th century (Hallett, 2007). Respiratory therapy, a relatively young profession, began in 1947 to address the increasing need for specialization in oxygen and related therapies (Smith, 1989). Curricular models for associate degree education emerged in the mid-1970s and solidified specific equipment and coursework to be delivered.

Accrediting bodies of these three referenced professions ensure the delivery of the specific content pertinent to their respective fields. Currently, accrediting agencies for respiratory therapy and medicine lack mandates for cross-professional education, while nursing only recently added related terminology within its 2008 guidelines (Committee on Accreditation for Respiratory Care [CoARC], 2010; National League for Nursing Accrediting Commission [NLNAC], 2008; Liaison Committee on Medical Education [LCME], 2011). The initial call for integration did not come from the accrediting and professional agencies but rather from practicing healthcare workers, researchers, and administrators.

Early studies (Weltz, 1965; Mathiasen, 1974) examining attitudes and beliefs of healthcare providers toward members of other professions demonstrated the presence of group theory, which maintains that an individual's behavior is shaped by the group of which he is striving to become a member (Huntington, 1957). Interestingly, little research focused on changing this behavior or integrating professions until the late 1970s, and these studies lacked strong theoretical and statistical methods. A researcher acknowledged this fact, stating:

> Spurred by intractable issues of fragmentation of services and lack of comprehensiveness, the proliferation of team and other kinds of integrated models have been reported in the literature but seldom conceptualized for their potential impact on service. Moreover, the literature generally lacks an empirical base and can be characterized as ideological. (Bassoff, 1983, p. 280)

This identification of the need for integration and lack of movement toward a functioning educational model continued into the mid-1980s to early 1990s, when healthcare reimbursement was rapidly changing.

Medical reimbursement services have had dramatic effects on the delivery of care within the United States. In 1983, Diagnosis Related Groups (DRGs) first appeared within national legislation to help contain the costs of fees charged by providers (Accardo, Damiani, Damiani, Geraci, & Tomasello, 2011). DRGs refer to:

> A classification system used to assess hospital services with the aim of streamlining health care costs and improving performance. The DRG system focus on the utilization of resources, and it is not concerned with the specific type of care provided to the patient. (Accardo et al., 2011, p. 106)

This system had profound effects on the healthcare industry. By providing payment based on the admitting diagnosis rather than for specific therapies, procedures, and medications delivered, the reimbursement sector forced healthcare reform. Unproven or unwarranted care that did not result in effective treatment of the medical patient resulted in a net loss for facilities delivering services. Evidence-based models for treatment needed to be developed based on best practice and interest in a coordinated, integrated workforce intensified.

During this period, Bassoff (1983, p. 282) reported four attitudes essential for cooperative functioning within the healthcare teams.

1. Attitudes of openness and receptivity to ideas other than one's own; flexibility.
2. Attitudes of value and respect for other disciplines; trusting others.
3. Attitudes of interdependence and acceptance of a common goal; commitment to patient care.
4. An attitude of willingness to share and take responsibility and ownership.

The concept of an integrated healthcare model slowly began to take hold within the clinical arena, and researchers eventually investigated its link to patient and monetary outcomes.

A coordinated workforce is proving successful for both patient safety and financial outcomes (Mitchell, Parker, Giles, & White, 2010; Rice et al., 2010). This caused administrators, educators, and researchers to further investigate how to integrate the various healthcare professions. Researchers within individual disciplines have argued that educators should:

> Change the professional education process so that respiratory therapists are able to achieve the needed skills and attitudes to work within a dynamic system...implement interprofessional education in the nursing profession for the benefit of society...and...include interprofessional health education and practice as a strategic area in medical schools. (Barnes, Kacmarek, Kageler, & Morris, 2011, p. 682; see also, Thibault, 2011, p. 313; Blue, Zoller, Stratton, Elam, & Gilbert, 2010, p. 204)

Although some professional educators have responded to the call for integration within education, the most beneficial method of IP education, the design of the curriculum, and the assessment of outcomes pertaining to this instruction has proven elusive (Zwarenstein, Reeves, & Goldman, 2009). However, specific theories of integration and collaboration, as well as theories of learning, can be used to direct collaborative activities.

Theories of Integration and Collaboration

The 3P (Presage, Process, Product) model of integration helps frame the factors affecting teaching and learning within collaborative teams (Freeth & Reeves, 2004). This theoretical model of integration and collaboration provides a framework for understanding the process of delivering a quality IP experience. It is composed of three stages that structure the progression of learning and collaboration (see Figure 2).

The presage factors list the context of the activity and characteristics of the learners and developers of the collaborative activity. These factors not only influence the learners' experience within the process but also have a direct effect on the collaborative product. The process, designed by the educator, is the medium in which the experiences occur and therefore influence and change the product. This medium is vastly important

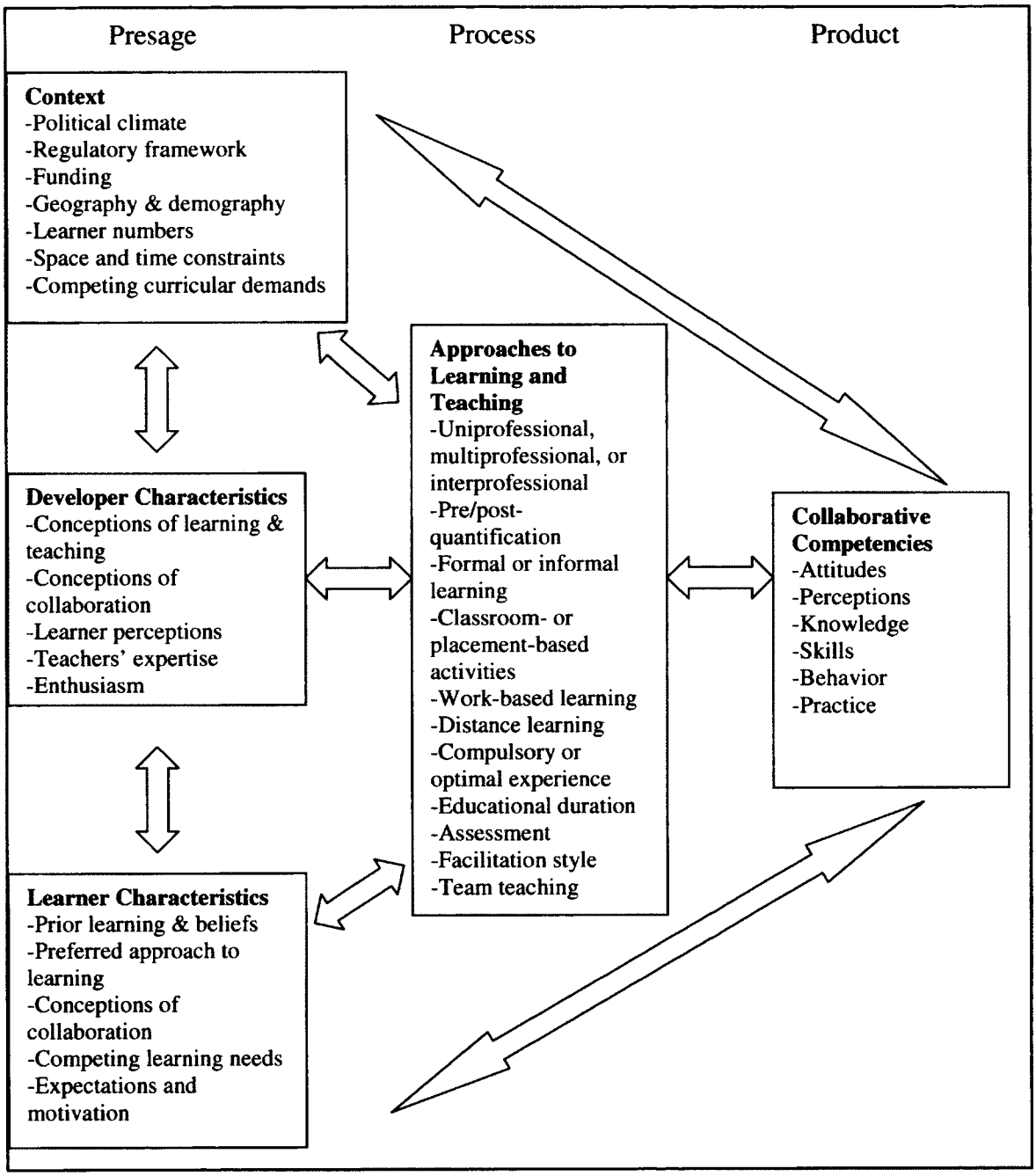

Figure 2. The 3P (Presage, Process, Product) Model of Integration. From "Learning to Work Together: Using the Presage, Process, Product (3P) Model to Highlight Decisions and Possibilities," Developed by D. Freeth and S. Reeves, 2004, *Journal Of Interprofessional Care*, *18*(1), p. 46. Adapted with permission of the author.

to promoting positive attributes within the participants as a result of the experience. The product then influences future interactions and changes the learners' presage factors, repeating the process during future activities. This bidirectional model is directly applicable to IP activities that attempt to change attitudes and beliefs for the benefit of patient care. Prior learning and beliefs, conceptions of collaboration, and learning needs are characteristics that directly relate to self-competency, need for social cooperation, and the value of non-self entities.

An individual's perception of self-competency is a characteristic that influences the learning process and the collaborative product. If participants' perceptions of their role within patient care are relatively low, their involvement within a structured IP activity designed to have them viewed as content experts should increase their attitudes and behaviors toward their own clinical practice. Participants that are overly confident in their knowledge base will be challenged by their reliance on other more able and skilled domain experts. This experience should facilitate a review of preconceived attitudes toward other professions, allowing for more fruitful future experiences.

Improving social cooperation, both actual and perceived, facilitates healthy, dynamic group functioning. Less-social individuals who hesitate to cooperate are challenged to deliver care within a multiprofessional collaborative approach. These individuals, if left alone, would not bring adequate skills and behaviors to clinical practice. Involving these individuals in situations that allow their unique skills to be used and appreciated should increase their future cooperative abilities. Cameron et al. (2009) discussed the confinements of an individual, nonintegrated curriculum as having negative effects on the understanding of other disciplines' abilities. Social barriers, possibly

developed within a confined curriculum or due to the presence of group theory, should begin to deteriorate as the knowledge of and camaraderie with other disciplines grow (Huntington, 1957). Social cooperation developed within educational arenas between individuals of different professions should translate into increased integration within clinical practice.

Valuing other participants' professional skills only increases reliance and cooperation between individuals delivering care. Acknowledging the abilities and skills of other content experts does not diminish perceptions of self-competency; rather, it builds group functioning and bidirectional respect. Similarly, increasing the value placed on other professions only reciprocates an increased appreciation for the skills they possess. This, in turn, increases social cooperation and group functioning.

The 3P model of collaboration and integration provides a useful framework for understanding how perceptions of self-competency, social cooperation, and the value placed on others affect group dynamics within structured instruction. Embedded within the 3P model is reflection, an important part of the experience because it promotes behavioral change. Within the medical field, reflection is a powerful process for changing preconceived notions and improving future performance (Blatt, Plack, Maring, Mintz, & Simmens, 2007). Griffiths, Goulet, Keefner, Ekstrum, and Schwery (2009) identified thinking (cognition), feeling (affect), and engaging (activities) as attributes that promoted reflection related to patient care. The reflective process that occurs between professional interactions within the patient arena is critical to changing attitudes and perceptions and is in agreement with voluntary behavior change theorists (Skinner, 1953). Individuals incorporated into structured group activities engage each other's

skills, attitudes, and values. This engagement results in personal reflection and can effect the professional growth of the individual. This growth then effects future interactions with members from other disciplines. Ultimately, patient care will improve from the functioning of a team well versed in the roles and abilities of the disciplines (Jones, DeVita, & Bellomo, 2011).

Models of Learning and Influencing Behavior Change

Nevid (2009, p. 166) described learning as "a relatively permanent change in behavior acquired through experience." Behaviorism, a theory of learning that focuses on observable behavior, is grounded in the evolutionary principles first established by Charles Darwin (1859). Since humans are closely related to primates and other mammals genetically, factors that influence other animals' behavior can be used to understand human psychology. Behavioralists have extensively studied learning in animals and humans and suggest that findings within one group can be applied to the other (Domjan, 2005). Associative learning is a fundamental principle within behavioral theory. It occurs when an organism makes a connection between two events (Pavlov, 1904; Skinner, 1953). Pavlov's theory of classical conditioning (1904) first reported the ability of an organism to associate an involuntary response to a conditioned stimulus. Skinner (1953) widened the understanding of behavioral conditioning when he reported on the concept of operant conditioning. This theory of voluntary behavioral change occurs when the consequences of an event change the probability of future behaviors. Operant conditioning differs from classical conditioning in that an organism must promote a voluntary change rather than elicit a neural, involuntary response. These responses to stimuli can be used to describe much behavior within organisms, but they do not depend

on higher-level cognitive functioning. Cognitive theorists describe observational learning as a main component affecting human behavior. Observational learning occurs when a person observes and imitates someone else's behavior. Bandura (1986) describes four components of observational learning: attention, retention, motor reproduction, and reinforcement. Observation of another individual performing a task or behavior requires the learner's attention. This modeled behavior and possible observed result must be retained within the subject's memory for recall during future events. The subject must reproduce the action and undergo reinforcement if the behavior is to be continued. Observational and associative theories are important when designing educational events but do not explain variances in reception and retention of information by different individuals.

The ability of an adult learner to receive and retain information is grounded in the learning style that he possesses and environments in which he is engaged. Gardner (2011) described multiple levels of intelligence that may be present in varying degrees in each individual. The theory of multiple intelligences suggests that there are a number of distinct forms of intelligence that each individual possesses in varying degrees. Gardner originally proposed seven primary forms: linguistic, musical, logical-mathematical, spatial, body-kinesthetic, intrapersonal, and interpersonal. During later reflection and research two more classifications, naturalist and existentialist, were included. Individual intelligences represent not only different content domains but also learning modalities. According to Gardner, everyone has these intelligences to varying degrees, and educational methods should focus on the particular intelligences of each person. Andragogical methods applied from this theory should focus on the alignment of the

facilitators' delivery to that of the learning style of the student. According to Stahl (2003), there has been a failure to match learning styles to instructional methods. The possible cause of this inability to effectively implement Gardner's theory to practice is possibly the shear number of individuals within a single class. Although this approach seems viable when facilitating the education of one or few students, individual structuring is not conducive for large groups. Facilitators should focus on varying the delivery of information in an attempt to capture and involve more of the audience through engagement with their learning domain. Collaborative activities should have component parts developed to engage many individual intelligences, leading individuals to be seen as content experts within their individual roles, possibly improving the perception of self-competency. Improving perceptions of competency within groups should lead to more cooperative functioning. Increased social cooperation with competent individuals will then lead to increased value placed on other members within the group.

Self-Competency

An individual with high levels of esteem and competency will promote higher functioning within groups. Maslow (1954) proposed a sequence of humanistic needs that must be satisfied in a specific order. Based on this theory, individuals must satisfy basic physiological needs prior to safety, their safety needs prior to belonging, and develop a sense of belonging prior to developing self-esteem and self-actualization. The lower levels of this model lend themselves well to behavioral theories (Pavlov, 1904; Skinner, 1953). Maslow argued that if a lower level was not met, progression to higher levels of human needs could not occur. If human behavior is motivated through these internal needs, an individual could not develop a strong sense of self-competency or group

belonging within a threatening atmosphere. This point is important when designing situations that lead to the acknowledgment of self-competency. A scenario must be developed in which individuals involved in the situation are familiar with the cognitive and psychomotor aspects requested of them. This will ensure that the individuals do not feel threatened by other participants and will be viewed as a content expert within an individual domain. Maslow's model is applicable in understanding the development of internal self-needs, but it does not fully explain human motivation when an individual determines a higher level is more important than a foundational one.

Self-determination theory lists three basic human needs required for growth (Deci & Ryan, 2002): competence, relatedness, and autonomy. Self-competence is an individual's feeling that he or she has the ability to change outcomes. It is related to the expectancy of success. Relatedness refers to the need to engage in social interactions, and it has been described by some researchers as one of the strongest motivators for changing human behavior (Baumeister & Leary, 1995). The last need, according to the self-determination theory, is autonomy, which is the ability to understand that the individual controls his or her role within a situation. Self-determination theory helps explain why individuals may forgo a foundational level of Maslow's needs in obtaining a higher one. Medical professionals will sometimes forgo basic needs (e.g., food and standard protective equipment) when patient needs are imminent. Viewing competence, relatedness, and autonomy as equal components may be more applicable to understanding human motivation within social groups than Maslow's hierarchy.

Understanding Maslow's hierarchy of needs and the self-determination theory helps construct the factors that influence self-competency and situations that can enhance

its development. A situation should be perceived as safe so individuals can obtain a social belonging within the group. Medical simulation laboratories lend themselves well to this purpose, allowing a participant to practice or demonstrate skills without the added pressure of a true clinical environment (Reese, Jefferies, & Engstom, 2010). Working within a group environment will increase social cooperation. Once this transition to belonging has occurred, self-esteem can improve, increasing the level of perceived competency. Competency is further enhanced when an individual acknowledges the ability to control his role in an environment and the ability to change the outcomes of the situation. Both the hierarchy of needs and the self-determination theory contain components of social cooperation within their structure. Acknowledging self-competency is enhanced through social structures and peer feedback.

Social Cooperation

Social interaction and cooperation is a human need illustrated by belongingness being a central component of the hierarchy of needs and relatedness to other people within the self-determination theory (Deci & Ryan, 2002; Maslow, 1954). It is important to focus on theories that effect this interaction to understand how situations can be developed to foster social cooperation.

Changing levels of cooperation within specialized groups involves implementing psychosocial approaches within the behavior and cognitive domains. Significant amounts of investigation within the social sciences have studied motivational forces that guide behavior (Pavlov, 1927; Skinner, 1953), and how these forces interact with and effect social cooperation (Thibaut & Kelley, 1959). Historical roots of classical behavioral change can be traced back to Darwin (1859), Pavlov (1927), and Skinner

(1953). Pavlov described respondent conditioning, also referred to as classical or "Pavlovian" conditioning, as involving a pairing of neutral and unconditioned stimuli repeatedly so an organism begins to associate the two. At the point of associated learning, the organism will transfer the neutral stimulus to a conditioned stimulus that will invoke the behavioral response (Pavlov, 1927). Skinner (1953) further described behavior modification through operant conditioning. This progression from classical conditioning focused on voluntary behavior rather than neural responses to external stimuli. Core facets of operant conditioning are the removal or addition of reinforcement or punishment to influence the voluntary actions of an organism. These two early findings led to popular, empirically supported behavioral change interventions within a wide range of human problems (Chambless & Ollendick, 2001).

Most theorists depicted social interaction as strictly self-interested, engaging in activities that only benefited oneself or when the cost-advantage ratio was perceived to be self-advantageous (Gilead, 2009). This is consistent with early behavioral theories (Pavlov, 1927; Skinner, 1953). However, authors challenge this strictly self-economic view, supporting a more multidimensional view of human motivation (Beck, 1976; Ellis, 1962; Sabbagh, 2010).

An extension from behavior theory involves personal thoughts regarding different environments and stimuli influencing the individual's responses. This cognitive approach is based in the concept that an organism's own thoughts, images, feelings, and beliefs produce behaviors (Bandura, 1986; Beck, 1976; Ellis, 1962). Self-modification of these processes, either through immediate acknowledgment or reflective meditation, will affect future, related circumstances. Bry (2011) explains that social cooperation is

influenced by belief, people, framework, trust, and leadership. These variables move away from the strict cultural anthropologist and self-economist views described by earlier researchers. A team will be influenced by a shared vision or belief to work collaboratively for the benefit of that ideal. Within medical simulation, individuals work toward a common goal of patient care. People within the team should be comfortable with each other so information flows easily between members. "Each of them should show an ability to listen, debate and collect ideas from each other..." (Bry, 2011, p. 8). The framework of the team must have defined roles and membership so trust in the abilities of members is apparent within the group. Shared leadership provides a focus to accomplish specific tasks.

Educational activities could combine the use of behavioral and cognitive theories to promote social cooperation. Within medical simulation, circumstances can be cultivated that engage the behavioral aspects of positive and negative reinforcement and punishment. Simultaneously, the participants within the simulation would develop thoughts, feelings, and beliefs that influence future behavior. Procedures completed on simulation mannequins can elicit responses to performed therapies. Additionally, facilitators can give feedback during or after medical simulations. These aspects are directly applicable to effecting and improving social cooperation within healthcare groups.

Value of Non-Self Entities

An individual's behavior is shaped by the group of which he strives to be a member and promotes a decreased value placed on other groups (Huntington, 1957). The group theory promotes individualization and decreases social interaction in

cooperative situations. Individuals within a specified profession often turn to members of their own discipline to assist in resolving problematic situations (Barr, 2005). Curran, Sharpe, Forristall, and Flynn (2008) surveyed pre-licensure students within medical, nursing, pharmacy, and social work fields and reported a significant difference in attitudes toward other professions. They concluded that the lack of immersion in experiences and clinical placement might have intensified incorrect stereotypes and unsupported beliefs about working with other members of the health field. Minimizing the effect of group theory involves understanding how individuals develop perceptions and theories that can challenge preconceived thought processes.

Self-value has long been associated with early positive reinforcement during development and it leads to confidence (Bossom & Swann, 2009). Similarly, the value placed on other individuals is affected by early exposure to and integration with other competent individuals. In the absence of this initial exposure, individuals are challenged by future relations with other individuals that fall outside of their perceptions. Cognitive dissonance and self-perception theories provide a strong theoretical basis for instilling and challenging attitudes about and beliefs in individuals (Festinger, 1957; Blem 1967). With cognitive dissonance, an individual perceives conflict when he sees inconsistency between what he believes and what he sees or does. An individual with low preconceived notions of the value of another profession will have dissonance when confronted with a situation in which an individual within that profession is a content expert. This confrontation in an individual's attitudinal belief system may cause changes in future behaviors (Festinger, 1957). Bem (1967) explained that a person's attitude is influenced by his or her behavior. When two individuals from different content areas are

confronted with a situation that lends itself to positive outcomes through cooperation, individual attitudes toward future behaviors will be influenced by that interaction.

Barriers to Effectiveness and Deployment of IP Activities

IP education faces many challenges that decrease its effectiveness. These barriers can be separated into factors that decrease the continuance of IP collaboration and issues related to implementation. Understanding these factors and minimizing the issues that can be controlled is important for effective collaborative instruction.

Four main obstacles have been identified in the maintenance of behavioral and attitudinal change (Sundel & Sundel, 2005). These obstacles are described as insufficient reinforcement of desired responses, reinforcement of undesired responses, lack of similarity between the practice environment and natural environment, and insufficient development of desired behaviors in the practice setting. These barriers to maintenance are in agreement with early behavioral theorists (Pavlov, 1904; Skinner, 1953). Many of these obstacles can be minimized or negated through proper planning of collaborative activities. Insufficient reinforcement of desired responses and reinforcement of undesired responses can be minimized through careful oversight and planning of simulation activities. Medical simulation has shown to be effective in mimicking clinical environments in a safe, controlled manner (Lynagh, Burton, & Sanson-Fisher, 2007). This should effectively negate the loss of clinical carryover caused by a lack of similarity between the practice and natural environments. Insufficient development within the practice setting should be addressed through increased time and focus spent on material. Proper planning and structuring of IP activities will lead to the successful retention of positive attributes; however, serious obstacles within professional realms exist.

Professional licensure stipulates that many procedures are discipline-specific, causing a sense of proprietary ownership and role competition that can undermine collaborative practice (CoARC, 2010; NLNAC, 2008; LCME, 2011; Mitchell, Parker, Giles, & White 2010). Participants may be concerned that IP education could lead to cross-training and result in a diminished role within their profession. This may make individuals defensive and protective of clinical areas associated with their discipline. Healthcare environments have published and unwritten managerial hierarchies and social circles that may decrease bidirectional communication (Magner, 2005). Participants that are primary care providers within specific disciplines and others trained in managerial duties may try to assume authoritative positions that also would affect cooperation. Participating individuals may also have different perspectives and values than others, and they may be unwilling to compromise.

Academic faculty members are critical for successful implementation of IP education within the student body (Webb et al., 2008). Therefore, it is important to understand their attitudes toward IP teamwork and education. Curran, Sharpe, and Foristall (2007) reported overall favorable attitudes toward IP education among members of medical, nursing, pharmacy, and social work faculties. The study concluded with:

> Profession, gender, and prior experience with IP education appear to be key attributes related to positive attitudes toward IPE education and interprofessional teamwork. Neither age, years of medical practice, nor experience as an educator appeared to influence individuals' attitudes towards IP education, IP learning in an academic setting, or attitudes towards health teams." (Foristall, 2007, p. 153)

Rye and Shelldey (2011) surveyed respiratory therapy faculty and listed scheduling, curricular constraints, time, and other demands as the top barriers to implementation of IP activities. Since faculty members agree that IP education is an important, innovative means for integrating collaborative activities within students' curricular models should be addressed.

Research studying the attitudes of health science students toward interprofessional teamwork and education is limited in number and in scope of practice. Most studies evaluated group beliefs regarding other professions or attitudes toward collaborative study, not events designed to challenge preconceived notions (Barr, 2005). Hawk et al. (2002) assessed students' concepts of current IP relationships and Rose et al. (2009) investigated attitudes of students towards implementation of IP education, but neither study attempted to modify or challenge these perceptions. Studies that did incorporate events designed to promote IP collaboration limited their participant focus to established professions. Neill, Hayward, and Peterson (2007) used participants from nursing, physical therapy, occupational therapy, physician assistant, and social work to assess IP teams within community based care. McFadyen, Webster, Maclaren, and O'Neill (2010) focused on nursing, occupational therapy, radiography, physiotherapy, and podiatry students to assess the impact of interprofessional education. Page et al. (2009) limited their focus to pharmacy students' reactions to IP collaboration. Educational mediums used to conduct the IP experience are also varied. Goelen, De Clercq, Huyghens, and Kerckhofs (2006) reported favorable outcomes when using problem-based learning (PBL) as a delivery medium. Clinical and community-based rotations have been used to attempt to modify students' perceptions of other disciplines, with varying levels of

success. Furze, Lohman, and Mu (2008) described only fifty percent of participants as having significant changes in perceptions of other healthcare workers after a community experience in caring for the elderly. Hayward, Kochniuk, Powell, and Peterson (2005) reported favorable changes in all subgroups towards other professions after a community-based practicum. Howell, English, and Page (2011) used a case study approach and followed three students through a four week rotation delivering collaborative care at a rural medical center. The study described an overall increase of positive perceptions towards other healthcare workers. Even nontraditional delivery of IP collaboration through computer conferencing has also been described (Becker, & Godwin, 2005). The lack of consistency in population, study design, and delivery causes an absence of a standard for delivery of IP education.

The knowledge required for participants in the evolving healthcare environment include group functioning and integrated roles and responsibilities for the different professionals making up the team. Skills in communication and leadership are also important. Attitudes include a willingness to collaborate, respect, act with openness, and trust in all members of the team. Embedding these skills within a curriculum can become cumbersome; however, multiple proposed types of delivery and scheduling are available.

Multiple Models

Integrating IP education into an existing curricular model can be difficult, and faculty members have identified this as the largest barrier to successful implementation (Cooper & Spencer-Dawe, 2006; Rye & Shelledy, 2011). However, multiple models have been proposed or implemented that are suited for most institutional or programmatic purposes. IP education may be centralized or decentralized, and the delivery of

information within these two classifications can vary significantly (Swisher, Woodard, Quillen, & Monroe, 2010). Decentralized IP programs involve small-scale planned learning experiences, while centralized delivery contains a core set of courses taught throughout the system (Swisher et al., 2010). The decentralized model is more easily implemented with a low number of directing individuals and a lack of centralized oversight. Additionally, the decentralized model is often initiated by highly motivated individuals concerned with the delivery of IP principles to their students. The centralized model, although theoretically more stable once integrated within a system, requires widespread commitment from faculty and administration, administrative oversight, higher financial needs, and is engrained within faculty workloads, which could lead to complacency on behalf of the directing individuals (Swisher et al., 2010).

There are multiple approaches to the actual delivery of the IP education. Within the decentralized model, facilitators can use workshops, simulation activities, team-building activities, or shared classes with an IP focus. The structure and content of these shortened activities must be planned with specific objectives, learning activities, and assessment strategies to maximize the allocated time available (Cook, 2005). The centralized model can use elective courses, distance education, an IP core curriculum, a clinical component, or a combination of all methods. Since this model is more embedded within the fabric of an institution, the objectives and assessment instruments should be developed in a more encompassing manner (Cook, 2005).

A standard model of healthcare education must include collaborative educational activities that involve multiple professions. These activities can be structured and administrated differently; however, their purpose and outcomes should always be based

in quality patient care. If students are taught to come together and utilize their collective skill sets and knowledge bases, the transition to a quality clinical model will occur in a more efficient manner. In addition, students should learn to appreciate each other's disciplines and their own after engaging in IP activities.

Summary

The research question guiding this literature review focuses on one generalized theme: Can IP activities affect participants' perceptions for the betterment of patient care? The literature review depicted a relationship between individual attributes necessary for successful collaborative practice and patient and financial outcomes. From previous research it has been established that students within various disciplines have a natural camaraderie with individuals from their own profession. This group theory and historically isolated curricular models effectively prevent collaborative integration. It is this fact that caused the researcher to focus on behavioral, motivational, and learning theories necessary to implement change within students' psychosocial collaborative attributes. These theories can be imbedded within the described 3P model of integration to promote reflective change within individuals' psyches. This change in attitudes within the defined categories should carry over to clinical practice, improving financial and patient outcomes.

The basis of this study was to determine the effectiveness of collaborative IP activities within healthcare programs. This chapter began with the history and development of IP education, explored theories of integration, collaboration, and models of learning, and focuses on literature describing self-competency, social cooperation, and the value of non-self entities. The chapter continued in describing possible barriers to the

initiation of IP activities and proposed the structuring of curricular models. This introduction was important, as it provided an overview of the current climate and importance of IP collaboration and laid the theoretical framework for the study. This literary analysis focused on the influences of self-competency, social cooperation, and the value of non-self entities within a group environment to better understand their effect within team-based patient care. Chapter III will provide demographic information on the sample population, survey methods, and procedures used to gather data needed to answer the research questions.

CHAPTER III

METHODS AND PROCEEDURES

This chapter overviews the methods and procedures used to conduct this mixed methods research study. It includes the demographic information related to the population including age, gender, and program of study. A description of the research variables and instrument used will then be discussed. Previous validity and reliability analyses of the survey expressed in narrative text and tables will be provided. Detailed explanations of the simulation environment, laboratory set-up, and the methods used for data collection will then be explained. The chapter concludes with the statistical analysis needed to answer the research questions.

Population

The research population consisted of students within specific programs from a single southwestern Virginia healthcare college during the fall 2012 semester. The population consisted of students enrolled within an Associate of Applied Science in Respiratory Therapy degree program (N=37) and a Baccalaureate of Nursing degree program (N=60). Due to the low number of students enrolled within these two programs, every student that consented to participate was included within the study. As shown in Table 4, the population consisted of students (male, N=21; female, N=76) ranging in age from 19 to 52 years within the two described degrees.

Research Variables

The independent variable was the instructional procedure used within the simulation setting. This instructional procedure may modify attributes that directly improve patient care. These attributes were identified within the literature review and

included: a valuing of others (e.g., attitudes of value and respect for other disciplines); cooperation (e.g., attitudes of openness and receptivity to ideas other than one's own, interdependence, acceptance of a common goal, shared responsibility); and self-competency (e.g., acknowledgment of the ability to change outcomes, expectancy of success, ownership). Increased measures within the defined parameters will have a direct effect on the dependent variable (Jones, DeVita, & Bellomo, 2011; Mitchell, Parker, Giles, & White, 2010; Myers, 2001; Rice et al., 2010) defined as the improved treatment of medical patients related to a valuing of others, cooperation, and self-competency.

Table 4

Population Demographics

Degree Enrolled	Number of Students (N=97)	Male / Female
Associate of Applied Science in Respiratory Therapy	37	17/20
Bachelor of Science in Nursing	60	12/48

Instruments Used

The purpose of this study was to determine the perceived value of interdisciplinary training for the improved treatment of medical patients. The researcher, with permission from the author, modified the Interdisciplinary Education Perception Scale (IEPS) to gain insight into changes in the dependent variable. The survey uses a 6-point Likert scale to force participants into levels of agreement or disagreement and a option for "Unable to Answer". The IEPS is an 18-item survey encompassing 4-subscales to assess individual perceptions of competency, perceived need for cooperation, perception of cooperation, and understanding other professions' value (Luecht, Madsen,

Taugher, & Petterson, 1990). Bassoff (1983) originally identified these attitudes and beliefs as instrumental to cooperative efforts and therefore essential for interdisciplinary service. The original instrument (Appendix A) was modified to reflect the individual professions enrolled within the study (Appendix B). Two additional survey items, (1) "This activity was important for my future as a healthcare provider", and (2) "This activity should be continued for future classes", were added to the post-survey instrument to gain insight into the needs for future project development. Additionally, two reflective, open-response questions, (1) "Describe your experiences working with nursing/respiratory therapy students during the recent IP activity", and (2) "How will experiences like this affect your future interactions with individuals from this profession?", were included in the post survey to give depth and possibly cross validate the quantitative instrument's findings related to the research questions (Appendix B).

Luecht, Madsen, Taugher, and Petterson (1990) developed and published the original 4-subscale IEPS to allow for the assessment of interdisciplinary education programs beyond basic performance indicators. The items within the IEPS were content-validated by five faculty researchers within the nursing and allied health professions. A consensus approach was used to ensure reliability. Items were then pre-tested with 27 senior occupational therapy students and reviewed for central agreement/disagreement values. The survey was subsequently deployed to 143 subjects within four different disciplines considered representative of normal university enrollments within allied health programs. The original authors then performed factor and reliability analysis of the psychometric properties of the instrument. This was followed with cross-disciplinary normative data and statistical power estimates for its appropriate use in related research

settings. The content analysis aligned the survey questions to subscale factors. The researchers explained the procedure for validation of the instrument in the original paper:

> Multiple linear regression was used to test the fit of the item breakdowns and factor score coefficients, relative to the four subscale factors. The average coefficient in each factor grouping was weighted by a constant of 10 and used in the rounded integer form shown at the bottom of Table 5. The sum of each factor group was then multiplied to the integer weight to determine the component sub score for scoring and regression purposes. (Luecht, Madsen, Taugher, & Petterson, 1990, p. 188)

Table 5

IPES Item Breakdown and Factor Score Component Loading
(N=143)

Factor 1		Factor 2		Factor 3		Factor 4	
Item	Coeff.	Item	Coeff.	Item	Coeff.	Item	Coeff.
1	0.192	6	0.595	2	0.218	11	0.401
3	0.146	8	0.595	14	0.272	12	0.443
4	0.198			15	0.293	18	0.504
5	0.198			16	0.281		
7	0.166						
9	0.221						
10	0.189						
13	0.153						
Mean	0.183		0.595		0.265		0.499
% Variance	44.8%		70.6%		56.2%		54.5%
Weight	2		6		3		4

Note. From "Assessing Professional Perceptions: Design and Validation of an Interdisciplinary Education Perception Scale," by R. Luecht, M. Madsen, M. Taugher, & B. Petterson, 1990, *Journal of Allied Health, 19*(2), 186. Adapted with permission of the author.

The R^2 values from the multiple regression of the actual factor scores upon the weighted subscale composites was then calculated. The R^2 explains the true variance of

the factor scores in the regression model and demonstrates high levels of linear fit (Table 6).

Table 6

Multiple Regression of Subscore Composites on Factor Score Components (N=143)

Factor	Subscore	R	R^2
Factor 1:	Perception of competence	0.998*	0.995
Factor 2:	Perceived need for cooperation	0.990*	0.980
Factor 3:	Perception of actual cooperation	0.999*	0.997
Factor 4:	Perception of others' value	0.989*	0.978
Total (all factors)		0.997*	0.993

*p≤ 0.001

Note. From "Assessing Professional Perceptions: Design and Validation of an Interdisciplinary Education Perception Scale." by R. Luecht, M. Madsen, M. Taugher, & B. Petterson, 1990, *Journal of Allied Health, 19*(2), 186. Adapted with permission of the author.

A Cronbach's alpha coefficient was used by the original authors to determine the internal consistency of each sub-scale. As depicted on Table 7, factor subscales 2 through 4 have marginal reliabilities. This can be attributed to the small number of survey items contained within each. The overall composite score for the instrument, however, remains considerably high.

After conducting the psychometric properties of the instrument, a statistical power estimate for its appropriate use in related research settings was performed assuming an experimental a-level of .05. The values expressed in Table 8 denote the number of participants needed to detect a significant difference at this level. For example, if a researcher wanted a 95% chance (as described under column 1-B) of detecting a

difference at a .05 level of significance within two separate groups, a population at or above 27 must be used within the study.

Table 7

Reliability Summary
(N=143)

Sub-scale	a-coeff.
Items in factor 1	0.823*
Items in factor 2	0.563*
Items in factor 3	0.543*
Items in factor 4	0.518*
All items	0.872*

*p≤ 0.01

Note. From "Assessing Professional Perceptions: Design and Validation of an Interdisciplinary Education Perception Scale," by R. Luecht, M. Madsen, M. Taugher, & B. Petterson, 1990, *Journal of Allied Health, 19*(2), 187. Adapted with permission of the author.

Table 8

Sample Size Requirements for Total Score Group Comparisons

	Number of Groups			
1-B	2	3	4	5
.7	14	17	19	21
.8	17	21	23	25
.9	23	27	30	32
.95	27	32	36	39

Note. From "Assessing Professional Perceptions: Design and Validation of an Interdisciplinary Education Perception Scale," by R. Luecht, M. Madsen, M. Taugher, & B. Petterson, 1990, *Journal of Allied Health, 19*(2), 187. Adapted with permission of the author.

The IEPS was employed by many research groups after its development both as a single survey analysis (Baker et al., 2008; Hawk et al., 2002; Rose et al., 2009) and within a pretest/posttest context (Becker, & Godwin, 2005; Cameron et al., 2008;

Hayward, Kochniuk, Powell, & Peterson, 2005; Kumar, 2011; Neill, Howell, English, & Page, 2011; Hayward, & Peterson, 2007).

McFadyen, Maclaren, and Webster (2007) further reported on IEPS validity through a separate content and test-retest analysis. The content analysis was determined by 12 academic health professionals, while the test-retest was performed on 348 (September 2003) and 284 participants (April 2004). This was initiated because "three of the original (instruments') internal consistency values reported were below .60 and several authors (Nunnally, 1978; DeVellis, 1991; Streiner & Norman, 1996) suggest that values of alpha coefficient below .60 are unacceptable..." (McFadyen, Maclaren, & Webster, 2007, p. 440). Subsequently, the researchers determined that the weighted Kappa values within five individual survey items were below a level of significance (.1020 to .0478) and reformatted the subscale based on a covariance structure analysis. Their results prompted them to adapt the original instrument by eliminating the five survey questions, two within factor 1 and three of which composed factor 4 (Table 9). Factors 2 and 3 were left unchanged. They continued to report on the adapted instruments' use within their undergraduate population (McFadyen, Webster, Maclaren, & O'Neill, 2010). The new instrument reported slightly higher internal consistency than the original instrument (Table 10) within factor 3 and a statistically insignificant change within factors 1 and 2. This was of interest to the researcher, as factor 3 remained unchanged between the two models and two items had been removed from factor 1 in the revised survey. The subsequent elimination of factor 4 did not necessarily diminish the validity of the original subscale within certain populations. "[T]he original subscale may

however be acceptable for use with mature undergraduates who have experience with clinical placements" (McFadyen, Maclaren, & Webster, 2007, p. 441).

Table 9

Comparison of Alignment of Survey Items with Factor Subscales

Factor	Definition	Original Paper Items	Revised Paper Items
1	Self-Competency	1, 3, 4, 5, 7, 9, 10, 13	1, 5, 7, 10, 13
2	Perceived Need Cooperate	6, 8	6, 8
3	Perception Actual Cooperation	2, 14, 15, 16, 17	2, 14, 15, 16, 17
4	Understanding Others' Value	11, 12, 18	removed

Note. From "The Interdisciplinary Education Perception Scale (IEPS): An Alternative Remodeled Sub-Scale Structure and its Reliability," by A. McFadyen, W. Maclaren, & V. Webster, 2007, *Journal Of Interprofessional Care, 21*(4), 439. Adapted with permission of the author.

Table 10

Internal Consistency of Subject Groups—a-coeff.

Factor	Definition	Original Luecht et al. (1990; n=143)	Revised McFadyn et al. (2003; n=308)	(2004;n=284)
1	Self-Competency	.82	.78	.86
2	Perceived Need Cooperate	.56	.38	.40
3	Perception Actual Cooperation	.54	.84	.83
4	Understanding Others' Value	.51	----	----

Due to the larger population of the revised subscale, the researcher used the subscale analysis for factors 1, 2, and 3. Additionally, the researcher decided to retain the original factor 4 subscale analysis due to its applicability to the population of the study group. This component breakdown was then used to answer the research questions.

Research Question 1— Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the competency of their own discipline?-was measured in Survey Questions 1, 5, 7, 10, and 13. These included: (1) "Individuals in my profession are well-trained", (5)

"Individuals in my profession are very positive about their goals and objectives", (7) "Individuals in my profession are very positive about their contributions and accomplishments", (10) "Individuals in my profession trust each other's professional judgment", and (13) "Individuals in my profession are extremely competent."

Research Question 2—Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their need to cooperate with the other medical discipline in providing enhanced health care-was measured from Survey Questions 6 and 8. These included: (6) "Individuals in my profession need to cooperate with (nursing or respiratory therapy) professionals", and (8) "Individuals in my profession must depend upon the work of people in the (nursing or respiratory therapy) profession."

Research Question 3— Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their actual cooperation with the other medical discipline?-was measured in Survey Questions 2, 14, 15, 16, and 17. These included: (2) "Individuals in my profession are able to work closely with individuals in the (nursing or respiratory therapy) profession", (14) "Individuals in my profession are willing to share information and resources with the (nursing or respiratory therapy) profession", (15) "Individuals in my profession have good relations with people in the (nursing or respiratory therapy) profession", (16) "Individuals in my profession think highly of (nurses or respiratory therapists)", and (17) "Individuals in my profession work well with the (nursing or respiratory therapy) profession."

Research Question 4— Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the value of the other medical discipline?-was measured in survey Questions 11, 12, and 18. These included: (11) "Individuals in my profession have a higher status than individuals in the (nursing or respiratory therapy) profession", (12) "Individuals in my profession make every effort to understand the capabilities and contributions of the (nursing or respiratory therapy) profession", and (18) "Individuals in the (nursing or respiratory therapy) professions often seek the advice of people in my profession."

Laboratory Setup and Procedures

An eight-station simulation laboratory was used for the collaborative experience. The simulation laboratory had been equipped with identical stations providing the participants with an individual video monitor, common exam table, headwall with compressed oxygen, air, and vacuum apparatus, intubation head, vascular access arm, and related equipment and supplies needed to perform the discipline-specific procedures (Table 11). Each simulation station was visually separated from the corresponding stations by way of a hanging privacy curtain (Figure 4). The video monitors, stationed at each individual simulation bay, were connected by coaxial cable to a single DVD player and signal amplifier. This enabled the researcher to broadcast a signal to all stations and allow the participation of 16 students simultaneously.

Table 11

Equipment Used in Simulation Activity

Shared Equipment	Respiratory Therapy	Nursing
Video Monitor	Intubation Mannequin	Venous Access Arm
Exam Table	Endotracheal tube	Intravenous (IV) Tubing
Tape	Laryngoscope	18 gauge IV Fluids
Assessment Equipment	Tube Verification Devices	Fluids and Infusion Pump

Figure 4. Simulation Laboratory

Directive Information for the Simulation

Participants were staged within three areas: (1) A room where introductions and procedural information were exchanged, (2) a simulation room (8-bed simulation laboratory enabling 16 students to rotate simultaneously), and (3) a debriefing room (allowing for a post procedural report). A maximum of thirty minutes was allocated for each station, allowing a maximum of five groups of 16 students to rotate in less than 4-hours. Each group spent no longer than 90 minutes introducing and exchanging procedural information, performing and assisting with discipline specific procedures, and providing a collaborative report on the simulated patient. Staging of the groups is described in Table 12. Directive instructions were delivered before and after each staging area (Appendix C).

Table 12

Participant Staging

TIME	PROCEDURAL INFORMATION EXCHANGE	SIMULATION	DEBRIEFING
8:00 - 8:30	Group 1		
8:30 - 9:00	Group 2	Group 1	
9:00 - 9:30	Group 3	Group 2	Group 1
9:30 - 10:00	Group 4	Group 3	Group 2
10:00 - 10:30	Group 5	Group 4	Group 3
10:30 - 11:00		Group 5	Group 4
11:00 - 1130			Group 5

Instructional Delivery Philosophy and Objectives

This collaborative experience allowed participants to provide care to a simulated trauma patient and portray themselves as a content expert in front of the other healthcare discipline. The instructional delivery method contained aspects of simulation, case study, and guided discovery. Objectives that directed the activity were as follows. By the conclusion of the activity the participant would master the following objectives:

1. Exhibit professional communication between disciplines.
2. Demonstrate cooperative attitudes during the shared responsibility of patient care.
3. Display competent knowledge and skills in the procedures performed.
4. Demonstrate attitudes of value and respect for the other discipline.

To evaluate the effectiveness of the activity upon these objectives, four open-ended questions were asked to each consenting participant following the debriefing sessions and

answers recorded. The faculty member then scored the responses based upon a five point Likert scale (Appendix D). The responses were then transcribed and the researcher reviewed responses to cross validate the faculty member's score.

Method of Data Collection

A paper copy of a modified Interdisciplinary Education Perception Scale (IEPS), adapted with permission from the original author, was administered one week prior to and immediately after the simulation activity in Fall 2012 (Appendix B). All students enrolled within the second year of an Associate of Applied Science in Respiratory Therapy degree program and the fourth year of a Baccalaureate of Nursing degree program who consented participated in the study. The students, prior to enrolling in the research study, had extensive cognitive and psychomotor development in discipline-specific techniques. Specifically, nursing students had been given theoretical and procedural knowledge related to intravenous access and blood transfusion. Respiratory therapy students had been trained in initiation and verification of endotracheal tube placement during intubation. Both groups had theoretical and clinical experience in patient assessment. Prior to the simulation activity, lists of students were paired using a random number generator. The students were separated into groups of 16 and instructed to report to a classroom outside of the simulation laboratory a half hour prior to the activity.

On the day of the simulation activity, the paired students were given two handouts on their specific competencies. They were instructed that they had 30 minutes to introduce themselves and educate each other on their discipline-specific procedures.

After the participants were acquainted and exchanged procedural information, they were led to an eight-bed simulation laboratory.

Two participants were placed in each simulation bay with privacy curtains effectively separating each group. Participants were instructed that they would watch a 5-minute introductory video and then have 30 minutes to assess and treat a simulated patient. It was explained that there was an expectation to teach and assist the other individual with performed procedures. Notepads and pens were provided, and the students were instructed to record pertinent information during this video. Following the procedure, a verbal collaborative report was to be given to a facilitator within a third room. After a verbal report was delivered, the participants were excused, and the post-survey was administered one week after the experience. Structuring the collaborative activity in three areas enabled multiple groups to rotate (i.e., 16 delivering procedural information within classroom, 16 performing the medical simulation, and 16 giving verbal reports and debriefing with facilitators).

The pre- and post-surveys, faculty evaluations, and audio recordings were coded and recorded with no identifying information, and the responses were kept confidential and secure according to the Internal Review Board of the hosting institution.

Statistical Analysis

Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, such as mean, frequency, and range, were used to analyze demographic information of the sample populations. The perceived value of the interdisciplinary training was assessed through the use of the Interdisciplinary Education Perception Scale (IEPS). The IEPS uses four subscales assessing participants'

perceptions of competency, perceived need for cooperation, perception of cooperation, and understanding the value of the other profession. Pre- and post-test scores on the four embedded sub-scales were analyzed individually with univariate, repeated measures two-way Analysis of Variance (ANOVA). Main effects for profession and change (2x2), as well as interactions, were tested. Statistical significance level was set at 0.05 or lower in the study.

A content analysis of the qualitative aspects of the post-survey questions, (1) "Describe your experiences working with (nursing/respiratory therapy) students during the recent IP activity", and (2) "How will experiences like this affect your future interactions with individuals from this profession?", were analyzed for reoccurring themes. These themes will be listed by frequency and direction (negative or positive) cumulatively in a manner consistent with qualitative inquiry (Creswell, 2007).

Summary

Chapter III outlined the methods and procedures used to gather and analyze data for this mixed methods study. Characteristics of the population, including gender, age, and enrolled degree program, were described. A description of the research variables and instrument used was then presented. Alignment of the survey questions to the independent variables (i.e., perception of competency, perceived need for cooperation, perception of cooperation, and understanding other professions value) was made in order to determine the effect on the dependent variable (i.e., improved treatment of the medical patient). The psychometric properties of the quantitative instrument used were presented to establish validity and the reliability of the instrument. Simulation laboratory setup and the method of data collection were explained, including procedures used for participant

confidentiality. The chapter concluded with the statistical analysis and measures intended to relay the results to the reader. The data collected within this study will be described within Chapter IV. Findings will be relayed to the reader though narrative text with supporting tables and figures.

CHAPTER IV

FINDINGS

The purpose of this study was to determine the perceived value of interprofessional training for the improved treatment of medical patients. This study was guided by the following research questions:

RQ_1: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the competency of their own discipline?

RQ_2: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their need to cooperate with the other medical discipline in providing enhanced health care?

RQ_3: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their actual cooperation with the other medical discipline?

RQ_4: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the value of the other medical discipline?

Data used to answer the research questions was obtained from three sources: (1) a quantitative analysis of a 18 question survey deployed before and after an interprofessional simulation experience, (2) qualitative analysis of two open-ended questions on the post survey instrument, and (3) qualitative analysis of verbal reports given by the participants following the activity. This chapter provides the findings from

the three measures under the sub-headings Report of Findings, Self Competency, Need to Cooperate, Actual Cooperation, Value of Other Discipline, and Other Findings.

Report of Findings

On September 17th, 2012, an invitation to participate was handed to the research population (N= 97) who were enrolled within an Associate of Applied Science in Respiratory Therapy and a Baccalaureate of Nursing degree program at a single, southwestern Virginia healthcare college. On September 21st, consenting participants (n=73) completed the IEPS survey and participated in an interprofessional simulation activity on October 1st. Immediately following the activity, consenting participants gave verbal reports which were recorded with an audio device (n=15). The participants then completed the post survey instrument (n=73).

The demographics of the research population were male/female, 14/59; age groups, 18-25 = 39, 26-30 = 18, 31-40 = 11, and >41 = 5. The demographics and degrees sought by participants are displayed in Table 13.

Table 13

Demographics, n=73

Sex	Number of Students
Male	14
Female	59
Ages	**Number of Students**
18-25	39
26-30	18
31-40	11
>41	5
Degree Being Sought	**Number of Students**
Bachelor of Science in Nursing	40
Associate of Applied Science in Respiratory Therapy	33

Discipline's Competency

Research Question 1 was to determine if interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the competency of their own discipline. This measure was captured in a weighted subscale comprised of Likert scaled Survey Questions (SQ) 1, 5, 7, 10, and 13 and a qualitative review of the open-ended questions added to the post survey. The weighted subscale, Perceptions of Discipline's Competency (PDC) questions included: (1) "Individuals in my profession are well-trained", (5) "Individuals in my profession are very positive about their goals and objectives", (7) "Individuals in my profession are very positive about their contributions and accomplishments", (10) "Individuals in my profession trust each other's professional judgment", and (13) "Individuals in my profession are extremely competent." Open ended, post survey questions included: (1) "Describe your experiences working with (nursing/respiratory therapy) students during the recent IP activity", and (2) "How will experiences like this affect your future interactions with individuals from this profession?"

A 2 x 2 mixed design ANOVA was conducted on the PDC subscale data. The between group factor was group (nursing vs. respiratory therapy) and the within group factor was time of testing (pre vs. post). The main effect of the between subjects variable was not significant using a critical α of .05 (F (1, 71) = .296, p = .588); see Table 14. This indicates that no significant difference existed on the PDC subscale between nursing (M = 4.914) and respiratory therapy (M = 4.981) groups (Table 15). The main effect of the within subjects variable was significant using a critical α of .05 (F (1, 71) = 33.402, $p < .001$). This is a very strong effect. A significant difference existed on the

PDC pretest (M = 4.7393) and posttest (M = 5.1486) scores. As Table 16 illustrates, the interaction effect of subjects and time was not significant using a critical α of .05 (F (1, 71) = .708, p = .403), thus there was no difference in PDC subscale change within the two groups between the times of testing.

Table 14

Tests of Between-Subjects Effects Perceptions of Discipline's Competency

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	3540.395	1	3540.395	6492.352	.000
Group	0.161	1	0.161	0.296	.588
Error	38.718	71	0.545		

Table 15

Descriptive Statistics Perception of Disciplines' Competency

Scale	Group	Mean	Std. Deviation	N
PDC Pre-Survey	Nursing	4.6825	.66183	40
	Respiratory Therapy	4.8081	.53665	33
	Total	4.7393	.60763	73
PDC Post-Survey	Nursing	5.1450	.66562	40
	Respiratory Therapy	5.1530	.48957	33
	Total	5.1486	.58866	73

Table 16

Tests of Within-Subjects Contrasts Perceptions of Discipline's Competency

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Linear	5.895	1	5.895	33.402	.000
Time*Group	Linear	0.125	1	0.125	0.708	.403
Error(factor1)	Linear	12.530	71	0.176		

Participant's responses on the post survey questions were analyzed for the overall direction of the response (Table 17). Component parts of participant's responses were

then separated and grouped into reoccurring themes. Thirty-one items were directly applicable to the perception of self disciplines competency. These included 26 positive, two neutral, and three negative items. The positive items included reoccurring themes of increased appreciation of the skills possessed, respect of the profession, and confidence in the ability to perform. The neutral and negative items included themes of nervousness causing a decreased competency, unfamiliarity with equipment, and unpreparedness for the activity (Appendix E).

Table 17

Overall Classification of Direction of Qualitative Responses

Group	Positive	Neutral	Negative
Nursing	32	4	3
Respiratory Therapy	26	5	2
Total	58	9	5

Need to Cooperate

Research Question 2 was to determine if interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their need to cooperate with the other medical discipline in providing enhanced health care. This measure was captured in a weighted subscale comprised of Likert-scaled SQ 6 and 8 and a qualitative review of the open-ended questions added to the post survey. The weighted subscale, Perceived Need to Cooperate (PNC) questions included: (6) "Individuals in my profession need to cooperate with (nursing or respiratory therapy) professionals", and (8) "Individuals in my profession must depend upon the work of people in the (nursing or respiratory therapy) profession." Open-ended, post survey questions included: (1) "Describe your experiences working

with (nursing/respiratory therapy) students during the recent IP activity", and (2) "How will experiences like this affect your future interactions with individuals from this profession?"

The PNC subscale was analyzed using a 2x2 ANOVA. The between group factor was group (nursing vs. respiratory therapy) and the within group factor was time of testing (pre vs. post). The main effect of the between subjects variable was not significant using a critical α of .05 (F (1, 71) = .005, p = .946); see Table 18. This indicates that no significant difference existed on the PNC subscale between the nursing (M = 5.2) and respiratory therapy (M = 5.189) groups (Table 19). The main effect of the within subjects variable was significant using a critical α of .05 (F (1, 71) = 6.866, p =.011). This is a strong effect and demonstrates that a significant difference existed on the PNC pretest (M = 5.0616) and posttest (M =5.3288) scores. The interaction effect of

Table 18

Tests of Between-Subjects Effects Perceived Need to Cooperate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	3903.566	1	3903.566	4466.065	.000
Group	0.004	1	0.004	0.005	.946
Error	62.058	71	0.874		

Table 19

Descriptive Statistics Perceived Need to Cooperate

Scale	Group	Mean	Std. Deviation	N
PNC Pre-Survey	Nursing	5.0625	.67166	40
	Respiratory Therapy	5.0606	.83626	33
	Total	5.0616	.74510	73
PNC Post-Survey	Nursing	5.3375	.88714	40
	Respiratory Therapy	5.3182	.74810	33
	Total	5.3288	.82166	73

subjects and time was not significant using a critical α of .05 (F (1, 71) = .007, p = .932), thus there was no difference in PNC subscale change within the two groups between the times of testing (Table 20).

Table 20

Tests of Within-Subjects Contrasts Perceived Need to Cooperate

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Linear	2.564	1	2.564	6.866	.011
Time*Group	Linear	0.003	1	0.003	0.007	.932
Error(factor1)	Linear	26.518	71	0.373		

Thirty-six qualitative component items were related to the perceived need to cooperate. These included 33 positive and three neutral items. The positive statements included reoccurring themes of effective communication, improved patient care, willingness to work together, common goals, and collaborative teamwork. The neutral items included themes of inability to communicate or cooperate during the activity (Appendix E).

Perception of Actual Cooperation

Research Question 3 was to determine if interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their actual cooperation with the other medical discipline. This measure was captured in a weighted subscale comprised of Likert-scaled SQ 2, 14, 15, 16, and 17 and a qualitative review of the open-ended questions added to the post survey. The weighted subscale, Perception of Actual Cooperation (PAC) questions included: (2) "Individuals in my profession are able to work closely with individuals in

the (nursing or respiratory therapy) profession", (14) "Individuals in my profession are willing to share information and resources with the (nursing or respiratory therapy) profession", (15) "Individuals in my profession have good relations with people in the (nursing or respiratory therapy) profession", (16) "Individuals in my profession think highly of (nurses or respiratory therapists)", and (17) "Individuals in my profession work well with the (nursing or respiratory therapy) profession." Open-ended, post-survey questions included: (1) "Describe your experiences working with (nursing/respiratory therapy) students during the recent IP activity", and (2) "How will experiences like this affect your future interactions with individuals from this profession?"

The PAC subscale was analyzed using a 2x2 ANOVA. The between group factor was group (nursing vs. respiratory therapy) and the within group factor was time of testing (pre vs. post). The main effect of the between subjects variable was not significant using a critical α of .05 (F (1, 71) = 1.726, p = .193); see Table 21. This indicates that no significant difference existed on the PAC subscale between the nursing (M = 4.915) and respiratory therapy (M = 4.72) groups (Table 22). The main effect of the within subjects variable was significant using a critical α of .05 (F (1, 71) = 42.791, p <.001). This was a very strong effect and demonstrates that a significant difference

Table 21

Tests of Between-Subjects Effects Perception of Actual Cooperation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	3357.864	1	3357.864	4217.011	.000
Group	1.375	1	1.375	1.726	.193
Error	56.535	71	0.796		

Table 22

Descriptive Statistics Perception of Actual Cooperation

Scale	Group	Mean	Std. Deviation	N
PAC	Nursing	4.6358	.79447	40
Pre-Survey	Respiratory Therapy	4.5197	.56485	33
	Total	4.5833	.69791	73
PAC	Nursing	5.1950	.70818	40
Post-Survey	Respiratory Therapy	4.9212	.70700	33
	Total	5.0712	.71598	73

existed on the PAC pretest ($M = 4.5833$) and posttest ($M = 5.0712$) scores (Table 23). The interaction effect of subjects and time was not significant using a critical α of .05 ($F(1, 71) = 1.152, p = .287$), thus there was no difference in PAC subscale change within the two groups between the times of testing.

Table 23

Tests of Within-Subjects Contrasts Perception of Actual Cooperation

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Linear	8.344	1	8.344	42.791	.000
Time*Group	Linear	0.225	1	0.225	1.152	.287
Error(factor1)	Linear	13.845	71	0.195		

Thirty qualitative component items were related to the perception of actual cooperation. These included 22 positive, two neutral, and six negative items. The positive statements included reoccurring themes of effective communication, improved patient care, willingness to work together, improved speed of task completion, confidence in the ability of others, and understanding of the abilities of the other profession. The two neutral items were based on the need for actual clinical interaction for improved cooperation. Items related to decreasing actual cooperation were the unfamiliarity with

equipment, inability to instruct or communicate, and a poor appreciation for the skills of the other discipline (Appendix E).

Value of Other Discipline

Research Question 4 was to determine if interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the value of the other medical discipline. This measure was captured in a weighted subscale comprised of Likert-scaled SQ 11 and 18, a qualitative review of the open-ended questions added to the post survey. The weighted subscale, Understanding Others Value (UOV) questions included: (11) "Individuals in my profession have a higher status than individuals in the (nursing or respiratory therapy) profession", and (18) "Individuals in the (nursing or respiratory therapy) professions often seek the advice of people in my profession." Open-ended, post survey questions included: (1) "Describe your experiences working with (nursing/respiratory therapy) students during the recent IP activity", and (2) "How will experiences like this affect your future interactions with individuals from this profession?"

The Understanding Others Value subscale was analyzed by a 2x2 ANOVA. The between group factor was group (nursing vs. respiratory therapy) and the within group factor was time of testing (pre vs. post). The main effect of the between subjects variable was not significant using a critical α of .05 (F (1, 69) = .480, p = .491); see Table 24. This indicates that no significant difference existed on the UOV subscale between the nursing (M = 3.741) and respiratory therapy (M = 3.854) groups (Table 25).

Table 24

Tests of Between-Subjects Effects Understanding Others Value

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	2037.500	1	2037.500	2193.995	.000
Group	0.446	1	0.446	0.480	.491
Error	64.078	69	0.929		

Table 25

Descriptive Statistics Understanding Others Value

Scale	Group	Mean	Std. Deviation	N
UOV Pre-Survey	Nursing	3.3991	.81331	38
	Respiratory Therapy	3.5303	.54559	33
	Total	3.4601	.70004	71
UOV Post-Survey	Nursing	4.0833	.92167	38
	Respiratory Therapy	4.1768	.94091	33
	Total	4.1268	.92516	71

Table 26 shows that the main effect of the within subjects variable was significant using a critical α of .05 (F (1, 69) = 36.351, $p < .001$). This demonstrates that a significant difference existed on the UOV pretest (M =3.4601) and posttest (M = 4.1268) scores. The interaction effect of subjects and time was not significant using a critical α of .05 (F (1, 69) = .029, p = .865), thus there was no difference in UOV subscale change within the two groups between the times of testing.

Sixty-one qualitative component items were related to the understanding the value of the other profession. These included 53 positive, three neutral, and five negative items. The positive statements included reoccurring themes of increased respect, appreciation, value, shared knowledge, effective communication, improved patient care, confidence in the ability of others, and understanding of the abilities of the other

Table 26

Tests of Within-Subjects Contrasts Understanding Others Value

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Linear	15.637	1	15.637	36.351	.000
Time*Group	Linear	0.013	1	0.013	0.029	.865
Error(factor1)	Linear	29.682	69	0.430		

profession. The three neutral responses were related to the high standard that the participants placed on the other profession prior to the activity. Items related to decreasing the value placed on the other profession were unfamiliarity with equipment, inability to instruct or communicate, and a poor appreciation for the skills of the other discipline (Appendix E).

Other Findings

The instructional delivery method contained aspects of simulation, case study, and guided discovery. Objectives that directed the activity were as follows:

1. Exhibit professional communication between disciplines.
2. Demonstrate cooperative attitudes during the shared responsibility of patient care.
3. Display competent knowledge and skills in the procedures performed.
4. Demonstrate attitudes of value and respect for other discipline.

The effectiveness of the activity upon these objectives was evaluated through four open-ended questions asked to consenting participants (n=15) following the debriefing sessions. To answer these objectives, the following questions were asked and recorded: (1) "What did you gain from the communication which occurred during the simulation activity or did barriers to that exchange exist", (2) "What do you feel were needed for

cooperation", (3) "What did you learn from the procedures completed by the other", (4) "How do you feel about working with members of nursing/respiratory therapy?" A faculty evaluator then scored the responses based upon a five-point Likert scale. Results are displayed within Table 27. The responses were then transcribed and reviewed by the researcher to cross-validate the faculty members scoring.

Table 27

Descriptive Data Related to Post Experience Debriefing

Objective	Mean	(SD)
Displayed professional communication between participants	4.00	(.926)
Demonstrates attitudes of cooperation	4.07	(.798)
Displays competent knowledge and skills in the procedures	4.13	(.743)
Demonstrate attitudes of value and respect	4.20	(.775)

Two additional survey items, (19) "This activity was important for my future as a healthcare provider", and (20) "This activity should be continued for future classes", were added to the post-survey instrument to gain insight into the needs for future project development. The responses to both questions were positive. Based on the six-point Likert scale, the participants (n=73) scored the first survey question, "This activity was important for my future as a healthcare provider", with a mean of 5.23 (SD = .995). The second survey question, "This activity should be continued for future classes," was scored with a mean of 5.29 (SD = 1.024). This indicates that the participants acknowledged the activity enhanced clinical practice enough to warrant its future use. The qualitative analysis of the post-test survey questions reinforced this finding. A reoccurring theme of the effectiveness of the activity emerged. Forty-seven individual items were coded as relating to the participants perception of the activities effectiveness.

Eighty-nine percent (42/47) were rated as positive with participants responding with appreciation of the experience, appreciation of the chance to work with other professions, and learned techniques not previously observed. The remaining 11% (5/47) listed items as negative or neutral related to the event as being disorganized, unprepared, or a general disagreement with the process (Appendix E).

Summary

This chapter provided the analysis of the data recorded from the sample population as related to each of the four research questions contained within the study. The survey questions and the coding of data were presented in order to facilitate an understanding of their importance to the research questions. Analysis of the results was provided for the instruments used. The demographics of the survey population (n=73) were reported and research question findings were discussed. The grouping of the data into four areas provided a focus for each of the research questions independently.

Research Question 1 was to determine if interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the competency of their own discipline. This measure was captured in a weighted subscale and a qualitative review of open ended questions added to the post survey. A 2 x 2 mixed design ANOVA was performed on the weighted subscale, Perceptions of Discipline's Competency. The main effect of time was significant using a critical α of .05 (F (1, 71) = 33.402, $p < .001$). A significant difference existed on the PDC pretest (M = 4.7393) and posttest (M = 5.1486) scores. This was the only relevant finding. Both the between subjects effect, α of .05 (F (1, 71) = .296, p = .588), and the interaction effect of subjects and time, α of .05 (F (1, 71) = .708,

$p = .403$), did not reach statistical significance. The qualitative analysis of comments strengthened the finding that the simulation was effective in changing participant's perceptions of their own competency. Eighty-one percent (26/31) of individual items related to the perception of self disciplines competency were identified as positive. Participants expressed an appreciation of the skills they possessed, respect for their profession, and confidence in ability to perform. The sixteen percent (5/31) of response items were rated as neutral or negative and listed as nervousness, unfamiliarity, and unpreparedness as affecting their experience.

Research Question 2 was to determine if interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their need to cooperate with the other medical discipline in providing enhanced health care. This measure was captured in a weighted subscale and a qualitative review of the open-ended questions added to the post survey. A 2 x 2 mixed design ANOVA was performed on the weighted subscale, Perceived Need to Cooperate. The main effect of time was significant using a critical α of .05 (F (1, 71) = 6.866, p =.011). A significant difference existed on the PNC pretest (M = 5.0616) and posttest (M = 5.3288) scores. This was the only relevant finding. Both the between subjects effect, α of .05 (F (1, 71) = .005, p = .946), and the interaction effect of subjects and time, 05 (F (1, 71) = .007, p = .932), did not reach statistical significance. The qualitative analysis of comments strengthened the finding that the simulation was effective in changing participant's perceived need to cooperate. Approximately 92% (33/36) of individual items related to the perceived need to cooperate were identified as positive. Participants responded that effective communication, improved patient care, willingness to work

together, common goals, and collaborative teamwork as reasons to increase cooperation. Eight percent (3/31) of responses were rated as neutral or negative and displayed themes of ineffective communication or cooperation during the activity.

Research Question 3 was to determine if interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their actual cooperation with the other medical discipline. This measure was captured in a weighted subscale and a qualitative review of the open-ended questions added to the post survey. A 2 x 2 mixed design ANOVA was performed on the weighted subscale, Perception of Actual Cooperation. The main effect of time was significant using a critical α of .05 (F (1, 71) = 42.791, p <.001). A significant difference existed on the PAC pretest (M = 4.5833) and posttest (M = 5.0712) scores. This was the only significant change. Both the between subjects effect, α of .05 (F (1, 71) = 1.726, p = .193), and the interaction effect of subjects and time, α of .05 (F (1, 71) = 1.152, p = .287), did not reach statistical significance. The qualitative analysis of comments lent support to the finding that the simulation was effective in changing participant's perception of actual cooperation. Approximately 73% (22/30) of individual items related to the perception of actual cooperation were identified as positive. The positive statements included themes of effective communication, improved care, willingness to work together, improved speed of task completion, confidence in the ability of others, and understanding of the abilities of the other profession. The remaining neutral and negative items were based on the participant's beliefs that clinical interaction is necessary for improved cooperation and effective communication.

Research Question 4 was to determine if interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the value of the other medical discipline. This measure was captured in a weighted subscale and a qualitative review of the open-ended questions added to the post survey. A 2 x 2 mixed design ANOVA was performed on the weighted subscale, Understanding Others Value. The main effect of time was significant using a critical .05 (F (1, 69) = 36.351, $p < .001$). A significant difference existed on the UOV pretest M = 3.4601) and posttest (M = 4.1268) scores. This was the only quantitatively significant finding. Both the between subjects effect, α of .05 (F (1, 69) = .480, p = .491), and the interaction effect of subjects and time, α of .05 (F (1, 69) = .029, p = .865), did not reach statistical significance. Qualitative analysis of comments strongly supported the finding that the simulation was effective in changing participant's perception of the value of the others profession. Approximately 77% (53/69) of individual items related to understanding the value of the other profession were identified as positive. The participants item responses included increased respect, appreciation, value, shared knowledge, effective communication, improved patient care, confidence in the ability of others, and understanding of the abilities of the other profession. The remaining neutral and negative items were based on the participant's prior beliefs regarding the other profession, a perceived unfamiliarity with equipment, or an inability to instruct or communicate.

The objectives of the educational experience were met or exceeded based on the post simulation interviews and subsequent scoring of participants. It should be noted that only 15 of the 73 students consented to be recorded for this portion of the study. Results

of the evaluator's scores were reviewed and justified by the researcher. The scores demonstrate achievement of the simulation objectives. Additionally, responses to the post survey questions, (19) "This activity was important for my future as a healthcare provider", and (20) "This activity should be continued for future classes", showed support for the activity from the participants.

Chapter V provides a summary of the findings presented in Chapter IV. Conclusions will be derived from the analysis of the data related to the research questions. Recommendations for the implementation of the findings and future research studies will be offered.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter begins with a restatement of the problem, presentation of the research questions, research instrument, population, limitations, and assumptions. A review of the literatures' significant points related to this study is then explained. The methodology, sample, findings, and results are then presented. Conclusions were drawn from the results of each research question. The chapter concludes with recommendations for implementation of the findings for educators, students, and practitioners, and future research that needs to be undertaken.

Summary

The purpose of this study was to determine the perceived value of interprofessional training for the improved treatment of medical patients. This study was guided by the following research questions:

RQ_1: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the competency of their own discipline?

RQ_2: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their need to cooperate with the other medical discipline in providing enhanced health care?

RQ_3: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their actual cooperation with the other medical discipline?

RQ_4: Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the value of the other medical discipline?

A modified Interdisciplinary Education Perception Scale (IEPS), adapted with permission from McFadyen, Maclaren, and Webster (2007), and qualitative review of two open-ended survey questions were used to collect data necessary to answer the four research questions. The respiratory therapy and nursing student populations were obtained through formal consent within normally scheduled classes in September 2012.

On September 17th, 2012, an invitation to participate was handed to the research population (N= 97) who were enrolled within an Associate of Applied Science in Respiratory Therapy and a Baccalaureate of Nursing degree program at a single, southwestern Virginia healthcare college. Consenting participants (n=73) within the respiratory therapy (n=33) and nursing (n=40) programs were comprised of both genders (male, n=14; female, n=40) ranging in age from 19 to 48 years (age groups, 18-25, n=39, 26-30, n=18, 31-40, n=11, and >41, n=5). In accordance with the research institution's Internal Review Board policy, students were assured by the researcher that all information would be held confidential and participation was entirely voluntary.

Limitations for this study included: A single simulation laboratory within a southwestern Virginia college was used as the location of the training, The study's population were students within the Associates in Applied Science for Respiratory Therapy program (n=33) and the Baccalaureate of Nursing program (n=40) within a single semester at a southwestern Virginia college. The training was initiated through an introductory video where participants were introduced to the simulation environment.

The introduction for the training was developed, produced, and videoed by faculty at a single southwestern Virginia college. The content presented followed national guidelines and was agreed upon by four masters and doctorial prepared faculty within the respiratory therapy and nursing programs.

Throughout the acquisition and collection of data for this study, the following assumptions were made: All students were familiar with and had working experiences in their respiratory therapy and nursing specific content performed within the training, Students were not content experts within the collaborating students' domain, Students did not have irreversible preconceived notions of the collaborating students' profession, and Increased perceptions of self competency, perceived need to cooperate, actual cooperation, and value placed on other professions positively effects IP practice and patient care.

The literature review began with an overview of the history and development of IP education; it explored theories of integration and collaboration; and focused on attributes of self-competency, social cooperation, and the value of non-self entities. The review of the literature concluded with possible structuring of curricular models and identified barriers to initiation of IP activities.

Specialization within society occurred early in human history (Trigger, 1998). This concept of focused study was very apparent within the medical community and led to a compartmentalization of different professions (Magner, 2005; Barr, 2005). Early curricular models reinforced this individualization by focusing on discipline specific competencies (Hallett, 2007; Smith, 1989). This curricular design caused a strong

association between the individual and profession which then carried into healthcare field (Weltz, 1965; Mathiasen, 1974).

In 1983, changes in medical reimbursement prompted a restructuring of the healthcare system (Accardo, Damiani, Damiani, Geraci, & Tomasello, 2011). This new reimbursement system prompted the development of evidence-based models and interest in a coordinated workforce intensified. The concept of an integrated healthcare model slowly began to take hold within the clinical arena, and researchers eventually investigated its link to patient and monetary outcomes. A coordinated workforce proved successful for both patient and financial outcomes (Mitchell, Parker, Giles, & White, 2010; Rice et al., 2010). Bassoff (1983) reported four attitudes necessary for effective team integration. These were openness and receptivity, respect for others, interdependence, and ownership. However, attributes necessary to function in teams were developed within the clinical site, prompting the call for integration within education. Currently the most beneficial method of IP education, curricular design, and the assessment method is still debated (Zwarenstein, Reeves, & Goldman, 2009).

Theoretical models of integration and collaboration can direct applications that increase IP collaboration. Freeth and Reeves (2004) developed the 3P (Presage, Process, Product) model which frames factors affecting teaching and learning within collaborative teams. The 3P model of collaboration and integration provides a useful framework for understanding how perceptions of self-competency, social cooperation, and the value placed on others affect group dynamics within structured instruction. Embedded within the 3P model is reflection, an important part of the experience because it promotes behavioral change and is related to future performance (Blatt, Plack, Maring, Mintz, &

Simmens, 2007). Griffiths, Goulet, Keefner, Ekstrum, and Schwery (2009) identified thinking (cognition), feeling (affect), and engaging (activities) as attributes that promoted reflection related to patient care. The reflective process that occurs between professional interactions within the patient arena is critical to changing attitudes and perceptions and is in agreement with voluntary behavior change theorists (Skinner, 1953). Ultimately, patient care will improve from the functioning of a team well versed in the roles and abilities of the disciplines (Jones, DeVita, & Bellomo, 2011).

Nevid (2009, p. 166) described learning as "a relatively permanent change in behavior acquired through experience." Behaviorism, a theory of learning that focuses on observable behavior, is grounded in the evolutionary principles first established by Charles Darwin (1859). Behavioralists have extensively studied learning in animals and humans and suggest that findings within one group can be applied to the other (Domjan, 2005). Associative learning is a fundamental principle within behavioral theory. It occurs when an organism makes a connection between two events (Pavlov, 1904; Skinner, 1953). This theory of voluntary behavioral change occurs when the consequences of an event change the probability of future behaviors. Observational learning occurs when a person observes and imitates someone else's behavior. Bandura (1986) describes four components of observational learning: attention, retention, motor reproduction, and reinforcement. Observational and associative theories are important when designing educational events but do not explain variances in reception and retention of information by different individuals. Gardner (2011) described multiple levels of intelligence may be present in varying degrees in each individual. Individual intelligences represent not only different content domains but also learning modalities.

Andragogical methods applied from this theory focus on the alignment of the facilitators' delivery to that of the learning style of the student. According to Stahl (2003), there has been a failure to match learning styles to instructional methods. Collaborative activities should have component parts developed to engage many individual intelligences, leading individuals to be seen as content experts within their individual roles, possibly improving the perception of self-competency. Improving perceptions of competency within groups should lead to more cooperative functioning. Increased social cooperation with competent individuals will then lead to increased value placed on other members within the group.

An individual with high levels of esteem and competency will promote higher functioning within groups. Maslow (1954) proposed a sequence of humanistic needs that must be satisfied in a specific order. If human behavior is motivated through these internal needs, an individual could not develop a strong sense of self-competency or group belonging within a threatening atmosphere. A scenario must be developed in which individuals involved in the situation are familiar with the cognitive and psychomotor aspects requested of them. Self-determination theory lists three basic human needs required for growth (Deci & Ryan, 2002): competence, relatedness, and autonomy. Self-competence is an individual's feeling that he or she has the ability to change outcomes and is related to the expectancy of success. Relatedness refers to the need to engage in social interactions, and it has been described by some researchers as one of the strongest motivators for changing human behavior (Baumeister & Leary, 1995). The last need, according to the self-determination theory, is autonomy, which is the ability to understand that the individual controls his or her role within a situation. Self-

determination theory helps explain why individuals may forgo a foundational level of Maslow's needs in obtaining a higher one. Viewing competence, relatedness, and autonomy as equal components may be more applicable to understanding human motivation within social groups than Maslow's hierarchy.

A situation should be perceived as safe so that individuals can obtain a social belonging within the group. Medical simulation laboratories lend themselves well to this purpose, allowing a participant to practice or demonstrate skills without the added pressure of a true clinical environment (Reese, Jefferies, & Engstom, 2010). Both the hierarchy of needs and the self-determination theory contain components of social cooperation within their structure.

Social interaction and cooperation is a human need illustrated by belongingness being a central component of the hierarchy of needs and relatedness to other people within the self-determination theory (Deci & Ryan, 2002; Maslow, 1954). Significant amounts of investigation within the social sciences have studied motivational forces that guide behavior (Pavlov, 1927; Skinner, 1953), and how these forces interact with and effect social cooperation (Thibaut & Kelley, 1959). Historical roots of classical behavioral change can be traced back to Darwin (1859), Pavlov (1927), and Skinner (1953). Most theorists depict social interaction as strictly self-interested, engaging in activities that only benefited oneself or when the cost-advantage ratio was perceived to be self-advantageous (Gilead, 2009). This is consistent with early behavioral theories (Pavlov, 1927; Skinner, 1953). However, authors challenge this strictly self-economic view, supporting a more multidimensional view of human motivation (Beck, 1976; Ellis, 1962; Sabbagh, 2010). Bry (2011) explains that social cooperation is influenced by

belief, people, framework, trust, and leadership. These variables move away from the strict cultural anthropologist and self-economist views described by earlier researchers. Within medical simulation, individuals work toward a common goal of patient care. People within the team should be comfortable with each other so information flows easily between members. Educational activities could combine the use of behavioral and cognitive theories to promote social cooperation. Within medical simulation, circumstances can be cultivated that engage the behavioral aspects of positive and negative reinforcement and punishment. Simultaneously, the participants within the simulation would develop thoughts, feelings, and beliefs that influence future behavior. Additionally, facilitators can give feedback during or after medical simulations which will in effect improve social cooperation within groups.

An individual's behavior is shaped by the group of which he strives to be a member and promotes a decreased value placed on other groups (Huntington, 1957). The group theory promotes individualization and decreases social interaction in cooperative situations and causes individuals to turn to members of their own discipline to resolve situations (Barr, 2005). Curran, Sharpe, Forristall, and Flynn (2008) demonstrated this and concluded that the lack of immersion in experiences and clinical placement might intensify the effect of group theory.

Value placed on other individuals is affected by early exposure to and integration with other competent individuals. In the absence of this initial exposure, individuals are challenged by future relations with other individuals that fall outside of their perceptions. Cognitive dissonance and self-perception theories provide a strong theoretical basis for instilling and challenging attitudes about and beliefs in individuals (Festinger, 1957;

Blem, 1967). With cognitive dissonance, a confrontation in an individual's attitudinal belief system may cause changes in future behaviors (Festinger, 1957). Additionally, Bem (1967) explained that a person's attitude is influenced by his or her behavior. When two individuals from different content areas are confronted with a situation that lends itself to positive outcomes through cooperation, individual attitudes toward future behaviors will be influenced by that interaction.

IP education faces many challenges that decrease its effectiveness. These challenges were separated into factors that decrease the continuance of IP collaboration and issues related to implementation. Obstacles identified that decrease continued collaboration were insufficient reinforcement of desired responses, reinforcement of undesired responses, lack of similarity between the practice environment and natural environment, and insufficient development of desired behaviors in the practice setting (Sundel & Sundel, 2005). These barriers to maintenance are in agreement with early behavioral theorists (Pavlov, 1904; Skinner, 1953). Obstacles to implementation included professional licensure stipulations, social and managerial hierarchies, faculty engagement, and curricular time restraints (Magner, 2005; Foristall, 2007; Rye & Shelldey, 2011). Additionally, research studying the attitudes of health science students toward interprofessional teamwork and education is limited in number and in scope of practice. The lack of consistency in population, study design, and delivery causes an absence of a standard for delivery of IP education.

Centralized and decentralized models have been proposed for IP education (Swisher, Woodard, Quillen, & Monroe, 2010). The centralized model, which is integrated within a curriculum, requires widespread commitment from faculty and

administration, has higher financial needs, and must be included within faculty workloads (Swisher et al., 2010). This model can use elective courses, distance education, an IP core curriculum, a clinical component, or a combination to deliver IP concepts. Decentralized IP programs involving small-scale planned learning experiences are more easily implemented. Additionally, the decentralized model is often initiated by highly motivated individuals concerned with the delivery of IP principles to their students. Within the decentralized model, facilitators can use workshops, simulation activities, team-building activities, or shared classes with an IP focus (Cook, 2005).

This research investigated students' perceptions of competency within their discipline, perceived need to cooperate, perception of actual cooperation, and the perception of other medical professions value before and after an interprofessional educational experience. The research population consisted of over 90 students at a private southwestern healthcare college in Virginia (N=97, n=73) who were enrolled within respiratory therapy (n=33) and nursing (n=40) programs. Statistical data necessary for the research, e.g., degree, gender, age, and survey responses were kept confidential and secure within the guidelines set forth by the host institution's Human Subjects Review Board.

The research variables were identified and aligned to answer each research question. Independent variables were identified from the literature and included: a valuing of others (e.g., attitudes of value and respect for other disciplines); cooperation (e.g., attitudes of openness and receptivity to ideas other than one's own, interdependence, acceptance of a common goal, shared responsibility); and self-competency (e.g., acknowledgment of the ability to change outcomes, expectancy of

success, ownership). Increased measures within the defined independent variables will have a direct effect on the dependent variable (Jones, DeVita, & Bellomo, 2011; Mitchell, Parker, Giles, & White, 2010; Myers, 2001; Rice et al., 2010) defined as the improved treatment of medical patients.

Conclusion

The investigation of changes in students' perceptions after a structured simulation activity at the southwestern Virginia healthcare college resulted in the confirmation of the research questions which were developed from the review of the literature. Quantitative evaluation of data reflective of students' perceptual changes was analyzed using SPSS®. Descriptive statistics, ANOVA, and qualitative findings were used to determine the significance of change within the independent variables, e.g., perceived need to cooperate, perception of actual cooperation, perception of disciplines competency, and understanding the value of the other discipline.

Research Question 1 was, "Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the competency of their own discipline?" Quantitative study findings based on a 2 x 2 mixed design ANOVA indicated that a significant change occurred within the weighted subscale, Perceptions of Discipline's Competency, when evaluating the main effect of time (F (1, 71) = 33.402, $p < .001$). This was the only relevant quantitative finding. Both the between subjects effect, (F (1, 71) = .296, $p = .588$), and the interaction effect of subjects and time, (F (1, 71) = .708, $p = .403$), did not reach statistical significance. The qualitative analysis of comments strengthened the finding that the simulation was effective in changing participant's perceptions of their own

disciplines' competency. Eighty-four percent of items expressed an appreciation of the skills they possessed, respect for their profession, and confidence in ability to perform, while the remaining 16% were rated as neutral or negative and listed as nervousness, unfamiliarity, and unpreparedness as affecting their experience.

It becomes evident from this analysis that an interaction with another discipline during a structured, collaborative activity increases individual awareness of self-competency. This awareness of competency is then projected upon the individuals' discipline. Deci and Ryan (2002) explained that self-competence is a feeling of ability to change outcomes. It is possible that although participants have performed these procedures prior to the activity within their individual programs, it is necessary for them to demonstrate their knowledge in front of other disciplines before they acknowledge their own competence. Individuals that are isolated within groups of their own discipline may not immediately comprehend they are content experts within their field. It is only when they present the information to others that this fact becomes self-apparent.

Research Question 2 was, "Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their need to cooperate with the other medical discipline in providing enhanced health care?" Quantitative study findings based on a 2 x 2 mixed design ANOVA indicated that a significant change occurred within the weighted subscale, Perceived Need to Cooperate, when evaluating the main effect of time (F (1, 71) = 6.866, p =.011). This was the only relevant quantitative finding. Both the between subjects effect, (F (1, 71) = .005, p = .946), and the interaction effect of subjects and time, (F (1, 71) = .007, p = .932), did not reach statistical significance. The qualitative

analysis of comments strengthened the finding that the simulation was effective in changing participant's perceived need to cooperate with approximately 92% of individual items related to this subscale identified as positive. These items listed effective communication, improved patient care, willingness to work together, common goals, and collaborative teamwork as reasons to increase cooperation with the other professional. The remaining 8% of items rated as neutral or negative displayed themes of ineffective communication or cooperation during the activity.

These results support using structured simulation activities to increase the perceived need to cooperate within participants. Structuring activities that allow participants to engage in successful social interactions will increase how the individuals relate the experience to future encounters. This finding is consistent with work performed by Baumeister and Leary (1995) demonstrating social interactions as strong motivators for changing human behavior. Participant comments of communication, improved patient care, willingness to work together, common goals, and collaborative teamwork are consistent with Brys' (2011) findings that social cooperation is influenced by belief, people, framework, trust, and leadership.

Research Question 3 was, "Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of their actual cooperation with the other medical discipline?" Quantitative study findings based on a 2 x 2 mixed design ANOVA indicated that a significant change occurred within the weighted subscale, Perception of Actual Cooperation, when evaluating the main effect of time (F (1, 71) = 42.791, p <.001). This was the only relevant quantitative finding. Both the between subjects effect, (F (1, 71) = 1.726, p =

.193), and the interaction effect of subjects and time, (F (1, 71) = 1.152, p = .287), did not reach statistical significance. The qualitative analysis of comments lent support to this finding with 73% of individual items being rated as positive with themes of effective communication, improved care, willingness to work together, improved speed of task completion, confidence in the ability of others, and understanding of the abilities of the other profession as reasons for cooperation during the simulation. The remaining neutral and negative items cited were based on the participant's beliefs that clinical interaction is necessary for improved cooperation and effective communication.

These findings demonstrate that structured interactive activities mimicking clinical environments improve the perception of actual cooperation between participants. Fostering an environment that promotes participants to feel safe and demonstrate skills without the added pressures of actual patients allows them to concentrate on integration and cooperation (Maslow, 1954; Reese, Jefferies, & Engstom, 2010). This will promote cooperative behaviors necessary for clinical carryover (Sundel & Sundel, 2005).

Research Question 4 was, "Do interactions with individuals from another health care profession within an interdisciplinary training activity affect participants' perceptions of the value of the other medical discipline?" Quantitative study findings based on a 2 x 2 mixed design ANOVA indicated that a significant change occurred within the weighted subscale, Understanding Others Value, when evaluating the main effect of time (F (1, 69) = 36.351, $p < .001$). This was the only relevant quantitative finding. Both the between subjects effect, (F (1, 69) = .480, p = .491), and the interaction effect of subjects and time, (F (1, 69) = .029, p = .865), did not reach statistical significance. Qualitative analysis of comments supported the finding that the simulation

was effective in changing participant's perception of the value of the others profession with 77% of individual items related to understanding the value of others as positive. The positive item responses included increased respect, appreciation, value, shared knowledge, effective communication, improved patient care, confidence in the ability of others, and understanding of the abilities of the other profession. The remaining neutral and negative item responses were based on the participant's prior beliefs regarding the other profession, a perceived unfamiliarity with equipment, or an inability to instruct or communicate.

Structuring cooperative simulation activities that rely on other disciplines' knowledge and skills increase the perceived value of that discipline. Huntington (1957) first described that an individual's behavior is shaped by the group of which he strives to be a member and promotes a decreased value placed on other groups. This promotes individualization and decreases social interaction in cooperative situations and causes individuals to turn to members of their own discipline to resolve situations (Barr, 2005). The data collected to answer Research Question 4 indicates that value placed on other individuals is affected by early exposure to and integration with other competent individuals. This method of early interaction could be used to answer the problems associated with clinical placement intensifying the effect of group theory (Curran, Sharpe, Forristall, & Flynn, 2008). The increased value placed on the other discipline could be the result of cognitive dissidence imposed through the course of the simulation or the result of positive interactions which occurred during the activity (Festinger, 1957; Bem, 1967).

The purpose of this study was to determine the perceived value of interprofessional training for the improved treatment of medical patients. This study was important to demonstrate the effectiveness of collaborative interprofessional activities within healthcare programs. Results of this study demonstrate that a structured simulation activity is effective in changing participants' perceptions within four key areas essential for improved patient outcomes (Jones, DeVita, & Bellomo, 2011; Mitchell, Parker, Giles, & White, 2010; Myers, 2001; Rice et al., 2010). These behaviors were described in the literature and include a valuing of others, a perceived need to cooperate, actual cooperation, and self-competency. Health care educators can use the results of this study to justify embedding IP activities within their related curriculum or guide instructors and administrators in modifying existing methods.

Recommendations

These research findings and conclusions support the following recommendations. These recommendations are separated for educators, students, and practitioners of the participating disciplines and future researchers.

It is recommended that educators and administrators designing interprofessional (IP) educational activities consider a highly-focused simulation activity to develop the collaborative traits necessary within their participants. Although many different types of structuring are available and data have not shown definitive success of one form over the other, the researcher has demonstrated that focused simulation activity is effective in developing attitudes needed for effective team integration (Bassoff, 1983; Swisher, Woodard, Quillen, & Monroe, 2010; Reese, Jefferies, & Engstom, 2010; Zwarenstein, Reeves, & Goldman, 2009). The instructional delivery method described within this

study was also extremely time effective in its delivery and could be used to answer the issue of curricular time restraints (Rye & Shelldey, 2011). It is also recommended that the staging of activities described within this study be replicated. The staging of the explanation of procedural competencies, simulation, and debriefing allows for socialization, bidirectional information exchange, and teambuilding. The researcher believes that this method is effective in changing behavior through experience (Nevid, 2009); allows individuals to form connections between this and future events (Pavlov, 1904; Skinner, 1953); allows for a diverse nature of information exchange that may be more encompassing to different learning styles (Gardner, 2011); and is delivered in a setting deemed safe by the participants allowing for individual growth (Maslow, 1954; Deci & Ryan, 2002). This method will allow participants to relate and engage in future social and professional interactions, which has been described as one of the strongest motivators for changing human behavior (Baumeister & Leary, 1995). Furthermore, it is recommended that educators and administers acknowledge the negative effects of group theory and engage other disciplines for the betterment of patient care (Huntington, 1957; Mitchell, Parker, Giles, & White, 2010).

It is recommended that students and practioners that will work in close proximity after graduation be identified and included for structured IP activities that focus on their discipline specific skills. The cognitive and psychomotor aspects of the skills should be engrained within the participants prior to the experience, allowing for an optimal comfort level (Reese, Jefferies, & Engstom, 2010; Maslow, 1954). The intent of this structure is to portray them as content experts within their field of study and increase the appreciation of those skills by the other members of the simulation team. This interaction will

increase the participant's perception of their own disciplines competency through the realization that they are content experts within their field of study. Participants of the simulation that view the practioner will place a higher level of value on the profession performing the skill. Additionally, structuring of simulation in this manner will decrease individual perceptions of professional autonomy and allow individuals to connect the simulation environment with future events (Pavlov, 1904; Skinner, 1953).

Structuring of simulation activities that include multiple professions should include competencies that require involvement from all parties. These competencies should be woven into a simulation activity by faculty representing the component disciplines. Ideally, no individual discipline should have a more encompassing role within the activity nor should one have a procedural competency that does not require assistance from another. All individuals within the structured simulation should have a vested interest in the outcomes of the activity and relate the importance of the procedures being performed within the team environment. This concept of relating to a common goal is a strong motivator for future growth (Deci & Ryan, 2002; Baumeister & Leary, 1995). Interaction with individuals that share a common goal fosters social cooperation and will build a framework of trust between participants (Bry, 2011).

For future research it is recommended to evaluate the retention of the described perceptual changes over time. It is possible that these beneficial changes will intensify after the activity due to reflection of the experience by the participants (Blatt, Plack, Maring, Mintz, & Simmens, 2007; Griffiths, Goulet, Keefner, Ekstrum, & Schwery, 2009). Classical behavioral theorists would argue that continued change in these perceptions would be dependent on events and stimuli occurring between the initial

experience and future assessments dates (Pavlov, 1904; Skinner, 1953). Regardless, the results of this study show improvement in key areas that are essential for quality patient care (Bassoff, 1983). Data should be monitored to evaluate the continued change of participants' perceptions over time. This could be accomplished through following participants in their careers and requesting a retrospective self-analysis at specific dates.

Data also need to be collected through objective measurement of the specific traits identified within this study in the clinical environment both before and after graduation. Although significant literature has demonstrated improved patient outcomes through IP training (Jones, DeVita, & Bellomo, 2011; Mitchell, Parker, Giles, & White, 2010; Myers, 2001; Rice et al., 2010), the structuring of the simulation activity contained within this study would be strengthened if it were directly linked to patient outcomes. The effect of change that occurred within this design was equal to or better than other reports of IP education (Goelen, De Clercq, Huyghens, & Kerckhofs, 2006; Furze, Lohman, & Mu, 2008; Hayward, Kochniuk, Powell, & Peterson, 2005; Becker & Godwin, 2005). This could begin to answer the question of the optimal design for IP activities (Zwarenstein, Reeves, & Goldman, 2009).

Research studying IP teamwork within health science students is limited or absent in some fields of study (Neill, Hayward, & Peterson, 2007; McFadyen, Webster, Maclaren, & O'Neill, 2010). It is recommended that future research be conducted to include more of the healthcare team. It is also recommended that activities designed to include more professions remain small scale and specifically tailored to the special skills and knowledge contained within the disciplines. Structuring in this manner will allow

participants to be viewed as content experts, develop bidirectional respect, and promote socialization.

Finally, research should be directed towards modern factors influencing the effect of group theory (Huntington, 1957). The researcher believes that this more than any other factor decreases the value placed on other disciplines and promotes individualization. Identification of what initiates and intensifies individualization should be central to increasing cooperation between different disciplines. Investigation of the effect of programmatic curricula, faculty, media, and the clinical arena on participants' views of their own and other professions should occur.

In conclusion, activities which engage different disciplines to integrate will decrease the negative effects of group theory (Huntington, 1957). These integrated teams will possess attributes necessary for improved patient care and financial outcomes (Bassoff, 1983; Correia, 2011; Mitchell, Parker, Giles, & White, 2010). These coordinated teams can be used in part to answer factors which will challenge the current healthcare system (Beekman, 2005; Zweifel, Felder, & Werblow, 2004; U.S. Census Bureau, 2011; Zweifel, Steinmann, & Eugster, 2005). This study demonstrated an effective method to increase students' perceptions of attributes found in effective clinical teams (Myers, 2001; Jones, DeVita, & Bellomo, 2011). The structure and concepts contained within the activity can be used to address many of the factors identified as barriers to implementation of IP activities (Lynagh, Burton, & Sanson-Fisher, 2007; Magner, 2005; Sundel & Sundel, 2005; Webb et al., 2008). Students, educators, and administrators should embrace the concept of engraining these skills within our future workforce for the betterment of patient care.

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Appendix A

Interdisciplinary Education Perception Scale (Luecht et al., 1990)

Please indicate the degree to which you agree or disagree with the statement by drawing a circle around the number of response that best expresses your feeling.
The scale is as follows: 6=strongly agree, 5=agree, 4=somewhat agree, 3=somewhat disagree, 2=disagree, 1=strongly disagree.

1. Individuals in my profession are well trained	6	5	4	3	2	1
2. Individuals in my profession are able to work closely with individuals in other professions	6	5	4	3	2	1
3. Individuals in my profession demonstrate a great deal of competency	6	5	4	3	2	1
4. Individuals in other professions respect the work done by my profession	6	5	4	3	2	1
5. Individuals in my profession are very positive about their goals and objectives	6	5	4	3	2	1
6. Individuals in my profession need to cooperate with other professionals	6	5	4	3	2	1
7. Individuals in my profession are very positive about their contributions and accomplishments	6	5	4	3	2	1
8. Individuals in my profession must depend upon the work of people in other professions	6	5	4	3	2	1
9. Individuals in other professions think highly of my profession	6	5	4	3	2	1
10. Individuals in my profession trust each other's professional judgment	6	5	4	3	2	1
11. Individuals in my profession have a higher status than individuals in other professions	6	5	4	3	2	1
12. Individuals in my profession make every effort to understand the capabilities and contributions of other professions	6	5	4	3	2	1
13. Individuals in my profession are extremely competent	6	5	4	3	2	1
14. Individuals in my profession are willing to share information and resources with other professionals	6	5	4	3	2	1
15. Individuals in my profession have good relations with people in other professions	6	5	4	3	2	1
16. Individuals in my profession think highly of other related professionals	6	5	4	3	2	1
17. Individuals in my profession work well with other professions	6	5	4	3	2	1
18. Individuals in other professions often seek the advice of people in my profession	6	5	4	3	2	1

Appendix B

Modified Interdisciplinary Education Perception Scale (Adapted from Luecht et al., 1990)

Please indicate the degree to which you agree or disagree with the statement by drawing a circle around the number of response that best expresses your feeling.
The scale is as follows: 6=strongly agree, 5=agree, 4=somewhat agree, 3=somewhat disagree, 2=disagree, 1=strongly disagree, U=unable to answer.

1. Individuals in my profession are well trained	6	5	4	3	2	1	U
2. Individuals in my profession are able to work closely with individuals in the respiratory therapy / nursing profession	6	5	4	3	2	1	U
3. Individuals in my profession demonstrate a great deal of competency	6	5	4	3	2	1	U
4. Individuals in the respiratory therapy / nursing profession respect the work done by my profession	6	5	4	3	2	1	U
5. Individuals in my profession are very positive about their goals and objectives	6	5	4	3	2	1	U
6. Individuals in my profession need to cooperate with respiratory therapy / nursing professionals	6	5	4	3	2	1	U
7. Individuals in my profession are very positive about their contributions and accomplishments	6	5	4	3	2	1	U
8. Individuals in my profession must depend upon the work of people in the respiratory therapy / nursing profession	6	5	4	3	2	1	U
9. Individuals in the respiratory therapy / nursing field think highly of my profession	6	5	4	3	2	1	U
10. Individuals in my profession trust each other's professional judgment	6	5	4	3	2	1	U
11. Individuals in my profession have a higher status than individuals in the respiratory therapy /nursing profession	6	5	4	3	2	1	U
12. Individuals in my profession make every effort to understand the capabilities and contributions of the respiratory therapists / nurses	6	5	4	3	2	1	U

13. Individuals in my profession are extremely competent	6	5	4	3	2	1	U
14. Individuals in my profession are willing to share information and resources with the respiratory therapy / nursing profession	6	5	4	3	2	1	U
15. Individuals in my profession have good relations with people in the respiratory therapy / nursing profession	6	5	4	3	2	1	U
16. Individuals in my profession think highly of respiratory therapists / nurses	6	5	4	3	2	1	U
17. Individuals in my profession work well with those in the respiratory therapy / nursing profession	6	5	4	3	2	1	U
18. Individuals in the respiratory therapy / nursing profession often seek the advice of people in my profession	6	5	4	3	2	1	U

Post Survey Additions

19. This activity was important for my future as a healthcare provider	6	5	4	3	2	1	U
20. This activity should be continued for future classes	6	5	4	3	2	1	U

Reflective Paragraph

Please use the space below to respond to the following questions:

Describe your experiences working with respiratory therapy students during the recent IP activity.

How will experiences like this affect your future interactions with individuals from this profession?

Appendix C

Verbal Instructions within Staged Areas

Prior to procedural information exchange: "Thank you for consenting to participate in this interprofessional simulation activity. You have been randomly paired with an individual from a different profession for this experience. You each have been provided with a sheet over-viewing one of your discipline specific procedures. Please take the next thirty minutes to introduce yourself to your partner and overview the cognitive aspects of each of your procedures. Once again, you have thirty minutes."

End of procedural information exchange: "Has everyone had time to introduce themselves and overview their specific procedures? Good, let's move to the simulation laboratory."

Prior to the simulation activity: "Please move to one of the simulation stations The laboratory has been equipped with identical stations providing you with an individual video monitor, common exam table, headwall with compressed oxygen, air, and vacuum apparatus, intubation head, vascular access arm, and related equipment and supplies needed to perform the discipline-specific procedures. You will be shown a short 5 minute video that introduces you to a simulated patient. Two tablets and pens have been provided at your station to take notes during the video. Following the video and subsequent procedures, you will need to deliver a collaborative report to a faculty member. Are there any questions?"

Start video, video displays the following:

Situation - A 26-year old patient, pedestrian is brought into the Emergency Department by EMS. The report from EMS states that patient was struck by a motorcycle traveling at 45 mph while bending to tight her shoes at a bus stop.

Background - Patient was unresponsive at the scene and a blood pressure was unattainable. The patient's other vital signs were: pulse – 132 and respirations of 10. An IV was started at the scene. An eighteen gauge in the L forearm with 2 litters NS infusing. A 14 or 16 gauge angiocath insertion failed. The patient assessed injuries include craniofacial and head lacerations without fractures with large amount of blood loss from those sites.

Assessment –Code status unknown; Allergies unknown;

VS: BP 94/38; P – 88; R - 10, T- 35.6 C

Neuro: Glasgow Coma Scale: 3

Respiratory: Cheyne-Stokes respiration

Abdomen: soft; non-tender; non-distended

Skin: Craniofacial lacerations; head trauma without fracture; decrease capillary refill; mottling

Labs/Diagnostics: Hemoglobin 7.4; Hematocrit 22.2;

ABG's pH - 7.01; PCO2 – 49; HCO3 – 16; Pa02 – 42%: Saturation – 75%

Recommendation - Physician orders: intubation r/t deteriorating respiratory status and 2 units of RBC's due to acute blood loss. When assessing the IV site infiltration was observed.

After video finishes: "You now have twenty-five minutes to stabilize your patient; there is no one on call and the pair of you are the only ones available to perform these procedures – please begin treatment."

End of simulation setting: Five minute warning precedes this announcement. "The allotted time has expired. Please gather your notes and proceed to the debriefing area."

Prior to the debriefing: "You will give a report to a faculty member who represents the attending physician who has just arrived. The physician does not know any history of the accident or the procedures performed. Please give a report to the physician in a manner consistent with your clinical rotations."

After debriefing: "Thank you for consenting to participate in this interprofessional simulation activity. I hope that you have benefited from the experience. Please gather your personal effects and you are free to leave."

Appendix D

Debriefing Evaluation Tool

Please score the responses based upon the following ranking:

1 - Extremely Poor
2 - Below Average
3 - Average
4 - Above Average
5 - Excellent

What did you gain from the communication which occurred during the simulation activity or did barriers to that exchange exist?

Displayed professional communication between participants 1 2 3 4 5

What do you feel were needed for cooperation?

Demonstrates attitudes of cooperation 1 2 3 4 5

What did you learn from the procedures completed by the other?

Displays competent knowledge and skills in the procedures 1 2 3 4 5

How do you feel about working with members of nursing / respiratory therapy?

Demonstrate attitudes of value and respect 1 2 3 4 5

Appendix E

Coding of Responses from IEPS Post-Survey

Perception of Disciplines Competency

Positive

1. The student I worked with knew her skills and taught me things about intubations that I did not know. I think she learned from me.
2. We learned from each other.
3. This will be very informational for me know if I ever see an experience about intubations.
4. The respiratory therapy student was competent and explained intubation thoroughly.
5. I think this positively impacts me and how I will interact with respiratory therapists.
6. She was very integrative and knowledgeable about the subject.
7. We taught skills and information.
8. My experience with nursing students in the simulation activity was very positive.
9. It was nice to receive the information that I would otherwise be unaware.
10. We asked questions to each other and were open and honest about what we had questions on.
11. I was comfortable teaching.
12. I enjoyed working with the nursing student; I think I taught her a lot.
13. My partner was able to explain the material to me, as well as show me in the lab.
14. I gave the opportunity to enhance my skills for when I will be needed in respiratory therapy situation.
15. We worked well together; she demonstrated the IV and I Intubation.
16. I couldn't do their job and they couldn't do mine, therefore we have to respect each other. It opened my eyes to be more willing to help and involved with other professions.
17. I had a good time and learned quite a bit today.
18. I felt confident performing and showing/teaching.
19. Nurses in the program seem to know their material very well.
20. I was prepared.
21. The tasks were both completed and we learned a great deal of information from each other.
22. I have respect for nursing; I believe I taught her about RT.
23. I didn't know that they didn't understand.
24. I thought the experience was good and the respiratory students were extremely prepared.
25. The respiratory therapist I was paired with was very educational and informative.
26. I will feel more confident in working with individuals from other professions.

Neutral

1. I wish that the skills had been practices more in class.
2. It was okay working with the RT students...I feel I can help them with their skill (intubation) but they couldn't help me much with my skill (IV).

Negative

1. We weren't able to teach one another about what we were doing because we were so busy doing our own things in a hurry.
2. I was nervous coming into the activity since I have only done one IV on a mannequin before and was scared to try teaching the skill.
3. It could possibly affect future interactions. I'm not sure I learned much except for how to help a RT with their skill. I feel it was ridiculous to teach RT students skills they will never perform, like blood transfusions or IV's. Why not perform a skill we can both do?

Perceived Need to Cooperate

Positive

1. Learn work was very important through this process and if we learn more about other professions we can better care for patients and help each other out.
2. I will be more willing to work with other professions.
3. Better communication will be helpful in future situations.
4. Interactions with different professions such as respiratory therapist are important because they have knowledge that we don't have.
5. A common goal.
6. I think interacting with those in other professions is important.
7. I have respect for the respiratory therapist because they are important in starting an airway in trauma patients.
8. We need to work together.
9. I value the work of the other profession greatly.
10. It helps to see what the nurses to do in a situation like that and not just focus on what the R.T. responsibility is.
11. It helps to understand that we are all doing separate things but we are all working toward the same goal. Also communication is very important and giving each other a hand.
12. This will allow for therapists to be more receptive to other professions.
13. Good experience working with nursing to see what responsibilities she had to do.
14. I have always thought that every individual's role in the hospital is important to keep it working as smoothly as possible.
15. I think this experience really shows you how close you work with nurses and that you need to work as a team.
16. I feel like it prepares me to work with other trades and professions that will take place on a regular basis in the future.
17. Procedures can be completed faster when we work together.
18. This experience will allow me to be a better health care provider and provide adequate care to the patient.
19. Every patient has a variety of needs therefore every health care provider needs to be able to communicate effectively.
20. My nurse was a really nice girl and she was good at explaining what she was doing and why she was doing it. I look forward to working with her in the future.
21. It allowed problem solving and goal oriented critical thinking at the team level to produce optimal results.

22. We will work together in the future.
23. It will make me more comfortable when approaching others from a different healthcare profession.
24. We worked well together and made the experience educational and enjoyable.
25. It gave me the opportunity to work in team like situations.
26. Teaches how to interest and work as a team.
27. I think the experiences like these are greatly beneficial to my future career.
28. I will definitely will collaborate with other professions and seek advice.
29. This experience helped me know what they do is important and that it's important to work well together.
30. We need to interact in the future.
31. I think it teaches both professions that ABC's are first... Also that if you work together, it gets done faster which allows patients to benefit.
32. I hope it allows everyone to remember that we are here for our patients.
33. Working with respiratory therapy students made me see that we all need to work together to take care of a patient.

Neutral

1. We did not converse very much during the activity but we were able to complete the task.
2. It may possibly affect future cooperation.
3. We would cooperate anyway.

Perception of Actual Cooperation

Positive

1. We were able to work as a team. They helped me bag and once my vent was "set up" I helped them with what they needed.
2. I enjoyed working and learning from them and seeing what they may do in an emergency situation.
3. It was nice to learn more about starting IVs and teaching them about intubation and ventilating.
4. I enjoyed the interaction with the nursing students.
5. I liked seeing ways we can help each other.
6. The nursing students were very willing to help with the intubation. They were curious and asked good questions. There was not a lot I could do to help them, but was a good experience.
7. I enjoyed the activity very much so I respect the nursing student and was paired up with and enjoyed teaching / explaining the procedures we do. (almost too much we ran out of time) this is an experience that should be done each year.
8. The respiratory therapy student explained how to intubate and the different aspects that go along with intubations.
9. Teamwork should always be used because you never know when you will be required to work together!
10. This activity taught me how important collaborations are, especially in a trauma situation.
11. She was very concerned about the patient and we worked together to complete a great experience!

12. My partner eased my mind and was a lot of fun to work with. I was able to help her bag the patient while she intubated which is not something I would have normally learned.
13. I feel that I will work well with respiratory therapists no matter what, but this gave me new insight into their profession. Also they are a part of the interdisciplinary team that cares for the different pts in the hospital.
14. I feel like we educated each other in our fields and were able to assist each other where needed.
15. Experiences like this are paramount in the future of health care in an effort to acclimate students to the "real world" where they are the decision makers and have complete autonomy.
16. My partner and I worked very well together. It was interesting learning about their profession and learning about intubation.
17. The tasks were both completed and we learned a great deal of information from each other. I see the maroon colored scrubs and until our collaboration, I had no idea who those students were.
18. I thought the experience was good and the respiratory students were extremely prepared.
19. Our careers are based on collaboration and this was very helpful.
20. It helps us to know what RT's can do in a trauma or emergency situation, and how we can work together.
21. I enjoyed working with respiratory therapists during the collaboration exercise.
22. I was able to practice my skills in an environment outside of lab and learn about other professions.

Neutral

1. I am not sure that it will. I think being on the job will effect the interactions. Confidence and competence will aid in communication will follow workers. Experience and knowing what to expect will help us to really understand our roles in an emergent event.
2. Difficult part was they did not feel comfortable doing anything we asked. They need to open up and tell us what else we can help them with to get the work done quickly. I work at the hospital as an NA now and see interactions between RT's and nurses and their interactions are for the most part very positive.

Negative

1. We weren't able to teach one another about what we were doing because we were so busy doing our own things in a hurry.
2. We could not work together.
3. I was not entirely able to understand why we were instructing RT students on Blood trans or IV insertion, when they aren't qualified to perform these tasks and vice versa with intubation.
4. I thought that the skills were (nursing) asked to demonstrate were useless to the respiratory students.
5. I tried to ask questions when the nurses were explaining their processes and we both helped when asked to but didn't necessarily say "what can I help with?" the nurses seemed less prepared on how use RTs for help with their parts.

6. The nursing students were nice, but did not know the equipment (threw off the students).

Understanding Others Value
Positive

1. It will make me have more respect for other professions and also want to learn more about other professions.
2. It will help me care about what they do.
3. It also will help me appreciate what other professions do.
4. The individual I was paired with was extremely knowledgeable about her field and experiences her procedure extremely well.
5. A very good teacher.
6. It helps me understand how RTs do their jobs and the restraints on doing intubation.
7. Respiratory therapy student was very willing to teach and show me how to intubate.
8. Never made me feel stupid or talk down to me.
9. High respect for what they do and will always value their input.
10. I enjoyed working with the RT.
11. It helps seeing how other professions work and do their knowledge on what nurses do.
12. I believe that this experience has helped me learn to "walk in someone else's shoes".
13. Once you understand how another profession works, you have more respect and understanding of their work.
14. It helps me as a nurse to be able to see how another profession works plus their knowledge about certain situations.
15. This was helpful when working with one another it taught me that you can always learn form other professions and each profession should be respected!
16. Watching the RT student intubate was helpful in understanding the importance of their profession.
17. This was a wonderful experience; he taught me a lot and having an extra set of hands and extra knowledge was very helpful.
18. He was able to teach me things that I probably would never learn in my classes about respiratory therapy.
19. Working with the nurses in the hospital should resemble this clinical simulation.
20. If we interact more together and share our knowledge, patient care will be optimized and efficiency will increase.
21. Have gained respect for the knowledge they have to know and apply.
22. I was able to share what I knew and learn new information from someone else wishing to work in the health care field.
23. I now better understand the role of an R.T. They do more than just neb tx's.
24. I have more appreciation for other professions. I am always impressed with the nurses because they have to know so much information. I honestly don't know how they retain so much. They have a huge responsibility.

25. My respiratory therapist was very knowledgeable and informative. He taught and listens as well.
26. It was good to work with another profession.
27. The RT student was very informative and easy to work with.
28. The students were very receptive and great teachers.
29. The respiratory therapist I was paired with was very educational and informative.
30. She will make a great respiratory therapist.
31. She was very thorough as well.
32. I will feel more confident in working with individuals from other professions.
33. I will respect their profession.
34. My experience made me see everybody is important.
35. The RT and I worked well together, and I was impressed with how well the RT knew material.
36. It will help me to feel more comfortable with them in the future.
37. I think this experience will make each profession appreciate the work of one another.
38. I feel more comfortable asking for RT advice because I feel that RT program has prepared their students well for their career.
39. I felt as though I learned something from the nursing students and I also was able to teach them something about us.
40. It will help us have a more positive outlook on the nursing profession as a whole and more prepared.
41. This experience helped me to better appreciate the various responsibilities that nurses have.
42. She was very kind and explained things well. I realized nurses will help you out with bagging if you need it, and hand you your ET tube while intubating.
43. I feel like nurses show RT's a lot more respect than we sometimes give them credit for.
44. I always thought nurses didn't appreciate RT's, but I learned not to be so stereotyped.
45. I respect nurses completely; I would have trouble doing a lot of the things they have to do.
46. Gives me more of an idea they will do in certain situations, like this one I will try and always keep an open mind to other professions.
47. The student I was with was very respectful of our profession and said "I don't know what you do so you let me know what you need help with." And she was very nice to work with.
48. It just shows that not all RT-Nursing relationships are as bad as we hear about or even see in the hospital. It's definitely necessary to work well with them.
49. My partner was knowledgeable and friendly.
50. I was nervous going into the activity. The nursing student quickly alleviated all of my nerves. She was professional, and humble. I felt as if it was nice to have an extra person on hand to help with the taping of the tube.
51. Positive- have better appreciation for what nurses do. It is good to work together and learn from each other and realize that we need each others help. It also shows a full complete care plan for the patient and see a holistic view of patient care.

52. I appreciate what nurses do and appreciate that they are able to see what I do and see the value in my profession.
53. I could tell that nurses are trained well. I also felt as if I was trained well in my profession/ skills.

Neutral

1. It does not really change my opinion of nurses or any other hospital profession because I have always thought we have important and separate roles.
2. I treat everyone in the hospital as equals.
3. I have always had respect for all people in the medical field and respect everyone for their specific role.

Negative

1. My Respiratory student was very knowledgeable, but not best at instructing another student in her field. Unfortunately, the relationships that I have witnessed in clinical have not mimicked this experience.
2. The nursing student did not understand the IV equipment.
3. Some nurses still seem to think less of the RT field as a whole.
4. I felt the experience working with the RT students was OK however I think it could have been better if the scenario wasn't on "trauma!"
5. The RT students were concerned with tape preparation, and did not treat intubation as an emergency.

Effect of the Experience

Positive

1. This was a great experience and I got to learn about things I have never learned.
2. It was very beneficial to learn how this is done for our clinical experiences.
3. It was a very beneficial part of our skills.
4. I think that this was a very helpful experience.
5. This was beneficial.
6. I enjoyed the opportunity.
7. This simulation was a great experience.
8. This experience was awesome.
9. It was a good experience.
10. It was a good experience.
11. The experience went well.
12. I enjoyed the activity.
13. Thanks for this opportunity.
14. I think that it was a great experience.
15. It was a good experience - nice to get to know students from another program.
16. I think this was a good activity.
17. It was a good experience.
18. This experience was very beneficial to my learning experience.
19. It was a wonderful experience.
20. It was a good experience,
21. Great experience
22. There was a very pleasant experience working with the nursing students.
23. This was a very pleasant experience.

24. Today's experience was good.
25. This was a good exercise.
26. Overall it was a good experience.
27. It was a good experience.
28. The IP activity was a great experience
29. I enjoyed it very much.
30. This experience was awesome
31. This was a wonderful experience
32. I think this was a good activity
33. I think that it was a great experience
34. It was good to work with the nursing students.
35. It was definitely a good experience.
36. I felt the experience was positive overall.
37. I think that we worked well together.
38. Overall, my experience was a positive one.
39. It was a great learning experience for me.
40. Good.
41. Thanks for the experience.
42. It was good.

Neutral/Negative

1. I feel as if this experience helped me learn what their goal is in a situation like we were given but I'm not sure it was very beneficial for me overall.
2. The experience was OK
3. I also felt it was unorganized.
4. I felt the class/event was very disorganized. We had to sit and wait 30 minutes after our designed time to receive instructions. We had no communication with the instructors on what was occurring. We seemed to be thrown into the event without preparation. If this event was to occur for a future class, it needs to be organized, clear, consistent, and on time. Otherwise it feels like a waste of time.
5. I don't feel like the simulation could have been completed.

VITA

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Formal Education & Degrees

May 2013	Doctorate of Philosophy in Education Concentration in Occupational and Technical Studies Emphasis in Career and Technical Education
April 1998	Master of Arts in Curriculum and Instruction Colorado Christian University, Grand Junction, CO
May 1996	Bachelor of Science in Cardiopulmonary Services State University of New York, Syracuse, NY
May 1993	Associate of Science and Certificate in Respiratory Therapy Mansfield University, Mansfield, PA

Professional and Related Work Experience

2011–Present	Program Director, Respiratory Therapy Jefferson College of Health Science Roanoke, VA
2004 – 2011	Director of Clinical Education, Respiratory Therapy Jefferson College of Health Science Roanoke, VA
1999-2004	Respiratory Therapy Faculty Kennebec Valley Community College, Fairfield, Maine
1992-2004	Acute Care Respiratory Therapist

Registry, Certifications, & Licensures

July 2004	Virginia Licensure Respiratory Therapy
August 2010	Neonatal Pediatric Specialist (NPS)
December 1993	Registered Respiratory Therapist (RRT)
July 1993	Certified Respiratory Therapist (CRT)

Emergency Medical Certifications

American Heart Association Advanced Cardiac Life Support (ACLS) Provider
American Heart Association Pediatric Advanced Life Support (PALS) Provider
American Heart Association Basic Life Support (BLS) Provider
Neonatal Resuscitation Provider (NRP) Provider

Professional Affiliations

American Association for Respiratory Care
Virginia State Society for Respiratory Care
Blue Ridge Chapter for Respiratory Care
Pi Lambda Beta (Honorary Society: Respiratory Care)

Publications and Related Research

Steer, G.S., Jones, G.S., Staykova, M.P., Airey, P.A., & Poulsen, C.P. (2011, October). Effects of an Interprofessional Clinical Simulation Activity on Student Confidence Levels of Interprofessional Team Collaboration [Abstract]. Respiratory Care, 56(10), 1717.

Poulsen, C. P. (2008). QA/QI - The Effect of Clinical Evaluators on Students Motivation and Stress Level. Unpublished raw data.

Poulsen, C. P. (2007). QA/QI - The Effects of Video Directed Instruction within a Simulation Laboratory on Student Satisfaction. Unpublished raw data.

Presentations (Selected)

(2011, November). *Effects of an Interprofesional Clinical Simulation Activity on Student Confidence Levels of Interprofessional Team Collaboration Skills.* American Association for Respiratory Care 57th International Congress, Tampa, FL.

(2011, October). *Pulmonary Management of Patients with Neuromuscular Disorders.* Virginia Society for Respiratory Care Mountain Air Symposium, Blacksburg, VA.

(2011, August). *Effects of an Interprofessional Clinical Simulation Activity on Student Confidence Levels of Interprofessional Team Collaboration.* Virginia State Simulation Alliance, Radford, VA.

(2011, July). *Effects of an Interdisciplinary Activity on Students Perceptions of Different Healthcare Professions.* American Association for Respiratory Care (AARC) Summer Forum, Vail, CO.

(2011, February). *Building an Interprofessional Bridge between the Classroom and Clinical Practice.* Lilly Conference on College & University Teaching, Greensboro, NC.

(2011, February). *Building an Interprofessional Bridge between the Classroom and Clinical Practice.* Conference on Higher Education Pedagogy, Blacksburg, VA.

(2010, December). *Resistance and Compliance in Mechanical Ventilation.* Virginia Tech–Carilion School of Medicine, Roanoke, VA.

(2009, September). *The Effect of Clinical Evaluators on Students Motivation and Stress Level.* Scholarship in Teaching and Learning Brown Bag Series, Roanoke, VA.

(2008, April). *Professionalism and Lessons Learned in Respiratory Care.* Carilion Clinic Spring Conference Topics in Respiratory and Sleep Medicine, Roanoke, VA.

(2003, May). *Finding Pneumo - Chest film Analysis for the Allied Health Professional.* The Maine Event, Lewiston, ME.