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The impact of a standardized participant simulation learning experience on the critical thinking disposition of undergraduate health administration students.

Fred DiCostanzo

THE IMPACT OF A STANDARDIZED PARTICIPANT SIMULATION LEARNING EXPERIENCE ON THE CRITICAL THINKING DISPOSITION OF UNDERGRADUATE HEALTH ADMINISTRATION STUDENTS

by
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Dedication

This work is dedicated to Michael J. Meehan whose faith and support make all things possible.

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Abstract

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The purpose of this action research study was (a) to observe the impact of simulation on the critical thinking disposition of undergraduate students in a health administration program, and (b) to observe faculty perceptions of the efficacy of simulation as a training and evaluative tool for undergraduate students in a health administration program. The California Critical Thinking Disposition Inventory (CCTDI) was used to measure critical thinking disposition in an experimental group of subjects before and after a simulation, and in a control group of subjects who did not undergo simulation. The experimental group scored higher on the post-test CCTDI than on the pre-test, and overall scores from the experimental group post-test were higher than those of the control group. Qualitative findings demonstrated that simulation challenged subjects in areas germane to critical thinking, such as leadership and interpersonal communication. Faculty observers of the simulations recognized that simulation-teaching techniques can be useful for management, leadership, and ethics instruction, and that simulation can be useful as a tool to evaluate technical and conceptual competencies of undergraduate students in a health administration program. Additionally, the research demonstrated how simulation could provide a concrete experience, which launches

experiential learning that, in turn, has the potential to improve critical thinking. A simulation/experiential learning model is also suggested.

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Chapter 1

Introduction

Teaching through simulation has been recognized as a valuable method for providing students with a glimpse of reality that is not readily available through textbooks or traditional classroom instruction (Grant & Marriage, 2012; Saunders, 1997). Rudimentary forms of simulation, such as case studies and role-play, have long been staples in business and healthcare education. With the technology boom of the late twentieth and early twenty-first centuries, there came a growing need for faster, more efficient methods to train healthcare and business students in the complex skills necessary to keep pace with a rapidly changing environment. These demands gave rise to new forms of technology-driven simulation that fueled more and better fabrications of realistic events (Faria & Wellington, 2004; Marriott, 2004, Saunders, 1997).

Newer forms of simulation include computer simulations and simulation games, as well as low fidelity simulations that make use of mechanical equipment to approximate basic human physiology and high fidelity simulators that use technologically advanced computers and equipment to emulate advanced clinical situations (Bearnson & Wilker, 2005; Wang, 2011). Simulation techniques have advanced to the point where actors trained to interact with students in a mock clinical encounter may be used alone or in combination with other forms of technology-driven simulation (Brender, Burke, & Glass, 2005). In recent years, studies have situated simulation as a teaching tool and demonstrated its value in promoting experiential learning, which in turn, stimulates the development of critical thinking skills (Clapper, 2009; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010). Additionally, studies show that faculty may use simulation

to evaluate teaching effectiveness and demonstrate student competence (Becker, Rose, Berg, Park, & Shatzer, 2006).

Basic simulation methods in the form of case studies and role-playing have long been staples of business and legal education (Saunders, 1997). More recently, computerized simulations, including business games, have gained popularity in accounting, management, business policy, and marketing (Faria & Wellington, 2004; Marriott, 2004). In healthcare, simulation techniques have advanced rapidly from basic role-playing to highly technical computerized fabrications that can replicate complex clinical situations (Cooper & Taqueti, 2004). The advent of simulations using "standardized patients" has added a human dimension to clinical education where students can practice communication skills, clinical technique, and interdisciplinary teamwork in a realistic work environment (Barnett, Hollister, & Hall, 2010; Brender et al., 2005). In addition to its practical training benefits, simulation may provide the basis for experiential learning, which in turn, enhances critical thinking ability (Lisko & O'Dell, 2010).

Despite its growing popularity in business and healthcare, simulation has not been widely adopted in healthcare administration. In addition to an understanding of the complexities of health services, healthcare administrators must contend with the operational factors inherent in general business; therefore, health administration students need competence in essential business areas such as communication, cooperation, collaboration, teamwork, planning, organizing, and controlling (Cellucci & Moses, 2009). Since healthcare administration has its roots in both business and healthcare, students in health administration programs may benefit from simulation training in areas

such as communication and interdisciplinary teamwork. The efficacy of simulation to train health administration students has not been thoroughly explored, and the impact of a simulation experience on critical thinking skills of health administration students is unknown.

Brief History of Simulation in Education

Simulation teaching methods have been employed by the healthcare and business professions to train students in the practical application of various concepts (Becker et al., 2006; Saunders, 1997). Simulation provides students with the opportunity to practice learned skills in a safe, controlled environment where realistic situations are created through the use of techniques such as role playing, case studies, computerized fabrication, and mock scenarios using trained actors. By creating "nearly real" scenarios, instructors expose students to diversity and create permutations of events that help learners develop organizational, teamwork, problem-solving, and crisis management skills.

Simulation, in its most basic forms, is not new to education. In legal instruction, case method, a technique whereby case studies are used to stimulate active learning by placing students in the position of decision-maker, was introduced at Harvard Law School in the late nineteenth century (Kunselman & Johnson, 2004). Through this process, students learned the finer points of law by examining and analyzing the specifics of real legal proceedings (Langdell, Christopher Columbus (1826-1906), 1997). In business, basic paper and pencil scenarios have long been used to help students integrate theory and practice. Today, these simple forms of stimulation are being replaced by methods such as complex case studies, computer-simulated spreadsheets, and other

games that create realistic business situations to enhance learning and challenge students in such areas as management, business policy, accounting, and marketing (Faria & Wellington, 2004; Marriott, 2004; Saunders, 1997).

The findings of Xu and Yang (2010) suggest that simulation creates a safe environment in which business students can develop synergistic knowledge and problem-solving skills by synthesizing diverse perspectives (p. 227). Marriott (2004) addresses the use of computer models to train accounting students and concludes that simulation helps students to cope with various permutations of a given situation.

In the clinical healthcare industry, the use of simulation teaching methods exploded with the advent of advanced technology. Technology and computers are now used to produce full-body, high fidelity simulations that accurately emulate various clinical scenarios, replacing the relatively primitive mechanical simulators of the past, which were capable of reproducing basic functions, such as respiration (Cooper & Taqueti, 2004). Learning through simulation is becoming a common experience for nursing and other healthcare students as more and more schools invest the time and resources necessary to develop the capacity for this type of instruction (National Council of State Boards of Nursing, 2009). In clinical healthcare education, simulation has expanded to include the use of standardized patients. Standardized patients are actors trained to play the part of patients and mimic the complaints or symptoms that students might observe in actual practice. In 2004, the Society for Simulation in Healthcare was founded to promote simulation as a valuable means to educate the interdisciplinary health team (Wang, 2011). Despite growing acceptance as a viable means for the education of

clinical practitioners, advanced simulation techniques have not been widely used in the education of health administration students.

Benefits of Simulation

Simulation provides learners with the opportunity to engage in realistic interactions where they can practice a variety of clinical and communication skills. For example, standardized patient simulations offer an expanded dimension to learning by allowing students to communicate with the actors after the experience and gain valuable feedback from the perspective of the service recipient (Brender et al., 2005). Much of the current research on the benefits of simulation focuses on student perception of the experience. Studies by Ravert (2002) and Mikkelson, Reim, and Harris (2007) focused on student reaction to simulation where the researchers concluded that students favored simulation learning and believed that they gained a greater awareness of the complexities of healthcare through the experience. Bearnson and Wilker (2005) looked at the effects of simulation on students' perception of clinical learning and found that students appreciated the opportunity to practice skills and gain increased confidence in their own abilities.

In addition to the benefits to students, simulation training offers faculty an opportunity to gather information about teaching effectiveness and student competence that can be used to improve curricula, form the basis of student evaluation (Becker et al., 2006), and enhance experiential learning which, in turn, may enhance critical thinking skills (Clapper, 2009; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010). Experiential learning is the ability to infer meaning from direct experience; it is a process that occurs in a cycle of four stages: Experience, observation/reflection, formation of

abstract concepts, and testing of new theories (Kolb, 1984). Saunders (1997) explored the use of simulation as a basis for experiential learning in business and technical communication and suggests that "Kolb's model of experiential learning provides a good theoretical basis for understanding [the learning process] and for developing and managing experiential exercises used in the classroom" (p. 110). Upon reflection from the instructor perspective, Akella (2010) concludes, "Kolb's model stimulates students and challenges them to develop necessary skills for effective thinking and problem solving" (p. 111).

When applying experiential learning theory and simulation teaching methods in nursing education, Lisko and O'Dell (2010) conclude that human patient simulators offer an important alternative to contextual learning and a means to facilitate the development of nursing students' critical thinking abilities. Critical thinking supports a high level of effectiveness in the teaching and learning process; it enhances proficiency in higher order thinking in areas such as history, science, and mathematics (Higher Education, n.d.), and helps students to identify central issues, recognize important relationships, and use data to infer, deduce, conclude, and evaluate options (Pascarella & Terezini, 1991). The affect of simulation on critical thinking skills of clinical healthcare students has been addressed in the literature. Results are mixed, with some researchers observing simulation as having a positive impact on critical thinking (Clapper, 2009; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010) and others finding no statistical differences between experimental and control groups (Goodstone, et al., 2013; Maneval et al., 2012; Mulnix, 2012).

Background of the Study

Centerville University (a pseudonym) is a private research university located in the inner city of an east coast state. According to its published materials, Centerville University is top ranked in the nation and boasts an overall enrollment that exceeds 25,000 students. Centerville prides itself on a reputation for experiential learning that combines technology, best practices, and research. The university has a long history of providing healthcare education to a wide range of disciplines, including healthcare administrators.

Centerville University recognizes the importance of simulation, and has assumed a leadership role in the design and implementation of simulation learning experiences for students in clinical healthcare practice. The university maintains a state-of-the-art simulation facility that includes a variety of highly realistic clinical practice settings, including examination rooms, conference rooms, and patient waiting areas. The facility is outfitted with technology that permits instructors to monitor and record simulation interactions for instructional purposes. Additionally, Centerville University employs a cadre of actors who portray patients in the simulation exercises. These actors are trained in specific scenarios that closely replicate real-life clinical situations. As a result, students can be placed in a controlled environment where conceptual learning and technical competencies may be tested and evaluated.

Critical thinking skills are a centerpiece of the health administration program at Centerville University, as indicated by clearly articulated program standards:

> [Students will] employ analytical and critical thinking skills to increase effectiveness and efficiency in the workplace and in the healthcare field. (Centerville University, 2008)

> The faculty are giving more emphasis to helping students identify a critical analysis framework, as faculty may ask students to think critically yet students may not know the basic elements of critical thinking. (Centerville University, 2008)

Additionally, the health administration faculty seeks to develop a capstone course designed to integrate and evaluate student learning at the conclusion of the program:

> Integration of conceptual and technical competencies must be demonstrated. These activities usually include, but are not limited to practica, internships, portfolios, projects, etc. (Centerville University, 2008)

> The program must demonstrate the mechanisms it uses to integrate the skills and knowledge obtained in the liberal arts foundation, conceptual and technical competencies in management. These frequently are found in a capstone course, case studies, simulations, etc. (Centerville University, 2008)

From the available program description, it is clear that the health administration faculty is seeking methods to promote critical thinking skills, and to produce a capstone experience that would effectively evaluate conceptual and technical competencies learned in the healthcare administration program. Currently, the program does not have a standardized method for promoting or measuring critical thinking. Capstone experiences currently under consideration for the health services administration undergraduate program include traditional methods of evaluation such as writing intensive courses and

portfolio evaluation. Simulation may offer a solution to the practice issues identified by faculty at Centerville University.

Purpose of the Study

The purpose of this study was to address needs identified by faculty in the health administration program at Centerville University as a means to promote critical thinking skills of students, and to effectively evaluate conceptual and technical skills learned in the undergraduate program. Simulation using live actors was introduced into the undergraduate health administration program, and the impact of simulation on the critical thinking of students was observed. The research may situate simulation as a means for promoting critical thinking skills through experiential learning, and for evaluating conceptual and technical competencies of students. The results of this research demonstrated that simulation is an effective means for experiential learning that ultimately enhances critical thinking skills. Faculty perceptions of the efficacy of simulation as a capstone evaluative tool were also observed. As an added benefit of this research, the health administration program at Centerville University was able to take advantage of available technology resources and provide its students with the same state-of-the-art simulation training enjoyed by students in other health disciplines.

This research was conducted in a practice environment for the purpose of addressing the needs of practitioners. I chose action research methodology because it permits practitioners to drive the research process within the practice environment, and because it is sensitive to emerging needs and changing situations in that environment. Action research is accomplished through a process of planning, acting, observing, and reflecting upon a given situation to increase knowledge (Herr & Anderson, 2005).

Research Questions

The following research questions guided the study:

1. How did simulation through the use of standardized participants impact the critical thinking disposition of undergraduate health administration students at Centerville University?
2. What were students' perceptions of the impact of a simulation experience on their own critical thinking skills?
3. What were faculty perceptions of the efficacy of simulation as a training tool for undergraduate students in the health administration program at Centerville University?
4. How can simulation be effectively used to evaluate conceptual and technical competencies of students at the conclusion of their undergraduate health administration program at Centerville University?

Significance of the Study

An applied action research study was used to discover whether or not the benefits of simulation learning observed in nursing and business can be extrapolated to healthcare administration education; it has the potential to introduce simulation learning to the area of healthcare administration, and to explore the impact of simulation using standardized participants on critical thinking skills of healthcare administration students through experiential learning in a realistic laboratory situation outside of the traditional classroom or real work environment (Brender et al., 2005; Marriott, 2004; National Council of State Boards of Nursing, 2009; Xu & Yang, 2010; Zigmont, Kappus, & Sudidoff, 2011). The study is important to faculty and administrators in higher education because of its

potential to influence educational policy and practice in the area of health services administration training (Royal, 2011).

Through this research, existing health services administration programs may be improved, and simulation learning may become accepted as an integral part of healthcare administration education. In a study by Royal (2011), healthcare administration students found that simulation provided a valuable learning experience. In other studies, business and clinical healthcare students found that simulation increased confidence, reduced anxiety, improved interdisciplinary communication, and may ease the transition to real-life practice (Barnett et al., 2010; Johnson, Salisbury, Deaver, Johansson, & Calisch, 2013; Sharpmack, Goliat, & Rogers, 2013). This research has the potential to situate simulation as a vital component of healthcare administration education, and demonstrate that simulation can provide the experience necessary to launch the cognitive processes important for enhancing critical thinking; thus healthcare administration students may improve critical thinking skills through practice in a safe, controlled environment (Clapper, 2009; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010).

Additionally, the business and service aspects of healthcare may become more integrated, resulting in a boarder multidisciplinary approach to training students in the healthcare professions (Barnett et al., 2010; Westberg, Adams, Thiede, Stratton, & Melissa, 2006). Finally, this research may provide a mechanism to assist health administration faculty at Centerville University to achieve established goals; it may positively impact critical thinking skills of students, and it may help to integrate the health administration program more fully into Centerville's culture of technology and

experiential learning (Centerville University, 2008). In general, faculty interest in simulation learning may be stimulated, thereby, increasing research on the subject.

Operational Definitions

The following definitions are offered to familiarize the reader with specialized terms and provide a context for meaning within the body of this work.

Clinical Healthcare – Clinical health services require hands-on, direct contact with patients. Examples of clinical providers include physicians, nurses, physical therapists, etc.

Conceptual Skills – The ability to see the relationship among various parts of a particular problem or situation.

Critical Thinking – The ability to question pre-conceived assumptions.

Experiential Learning– The ability to infer meaning from direct experience.

Health Services – The portion of healthcare service that deals with leadership, management, and non-clinical services.

High Fidelity Simulation – Reproduction of realistic events through the use of technology and computers.

Reflection Skills – The ability to look back on an event and evaluate personal reaction based on theory and best practice.

Simulation – A teaching pedagogy that imitates but does not duplicate reality (Rockstraw, 2006). For the purposes of this study, clinical simulation will be achieved through the use of Standardized Participants in a controlled environment where principles of leadership and team management may be practiced in a realistic setting.

Standardized Participant – An actor who has been trained to take part in a pre-determined scenario designed to simulate a real-life management situation.

Standardized Patient – An actor who has been trained to take part in a pre-determined scenario designed to simulate a real-life clinical situation.

Conclusion

Simulation is widely accepted as a form of experiential learning, and the literature situates experiential learning as a motivator for critical thinking (Lisko & O'Dell, 2010). While simulation and its application to the experiential learning process have been addressed in clinical healthcare and business education, the literature lacks any such connection between health administration education, simulation, and the experiential learning process.

Centerville University has an active and growing health administration program. The program faculty has established goals related to critical thinking and program evaluation, but appear to lack clear-cut methods for outcome measurement in those areas. As a university, Centerville is committed to simulation education; there is a state-of-the-art simulation infrastructure in place, and simulation learning is integrated into the curricula of the clinical healthcare programs. However, simulation is not employed in the education of health administration students; therefore, the health administration program does not make use of all the resources at its disposal, and its students are not exposed to the benefits of simulation, as are students in the clinical health setting.

An applied action research study has the potential to address gaps in the literature related to the use of simulation in health administration education, and its impact on experiential learning and critical thinking skills of students. Further, action research

presents an opportunity to address a practice issue related to the use of simulation as a capstone evaluative mechanism in the healthcare administration program at Centerville University. The implications for the academy are numerous, as this research has the potential to spark academic interest and raise additional opportunities for study.

Chapter 2

Literature Review

Introduction

Despite its growing popularity in business and healthcare, simulation has not been widely adopted in healthcare administration, a profession that has its roots in both business and healthcare. Therefore, the efficacy of simulation to train health administration students has not been thoroughly explored, and the impact of a simulation experience on critical thinking skills of health administration students is unknown. The purpose of this study was to introduce simulation using live actors into the undergraduate program at Centerville University, and to observe the impact of simulation on the critical thinking of students. Further, the research may situate simulation as a means for promoting critical thinking skills and for evaluating conceptual and technical competencies of students – needs identified by the health administration faculty at Centerville University. The goals of the research were addressed through an applied action research study that introduced a simulation experience to undergraduates in the healthcare administration program at Centerville University, observed the impact of simulation on the critical thinking skills of students, and observed faculty perceptions of the efficacy of simulation as a capstone evaluative tool.

The literature review is organized into eight sections. Each section is designed to address an area germane to the research questions. The first section will provide an introduction to the topic, along with a broad definition of simulation learning, and an overview of the use of simulation in education; the second section addresses the history of simulation in general business education, and provides a broad overview of various

simulation techniques popular in the business sector; section three addresses the topic of simulation in healthcare administration education; section four provides a review of the history and application of simulation in the healthcare and clinical education -- various types of healthcare simulations are addressed, as well as a survey of their use in medicine and nursing education; the fifth section establishes a definition of "standardized patients" -- examples from the literature are provided to demonstrate how this technique has gained popularity in the healthcare industry, and how various professions have applied standardized patient simulations in the education of students; section six provides a definition for critical thinking and introduces simulation as a possible impetus for critical thinking; section seven discusses the concept of experiential learning and introduces simulation as a possible impetus for launching experiential learning as described by Kolb (1984); and the final section introduces simulation for use as a capstone experience to evaluate learning accumulated in a program or course of study in undergraduate health services administration.

Simulation in Education

According to Gaba (2007), "simulation is a technique – not a technology – to replace or amplify real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner" (p. 126). Learning through simulation involves the artificial replication of realistic events in a safe, controlled environment where students can practice skills, learn techniques, and cope with the complexities of a given situation (Como, Kress, & Lewental, 2009).

Typically, simulation can be classified as low or high fidelity. Low fidelity simulation uses basic mechanical equipment to instruct students in various procedures,

while high fidelity simulation includes technologically advanced equipment, computers, and software designed to closely emulate various permutations of a clinical scenario (Wang, 2011). Some of the most widely used simulation techniques involve written scenarios, simulation games, and computer simulations (Bearnson & Wiker, 2005). In healthcare, a variety of other simulation techniques are common, including human patient simulators – computerized mannequins designed to emulate the physiology of a human being (Pacsi, 2008), and standardized patients – actors trained to provide students with a realistic approximation of a health service encounter (Brender et al., 2005).

Simulation provides an opportunity for students to learn and practice skills and techniques that are germane to various professions. When done in a focused and careful manner within the context of adult learning theory, simulation can make use of hands-on experience and guided reflection to facilitate experiential learning (Zigmont et al., 2011). Simulation provides students with the opportunity to acquire knowledge through doing, thinking, assimilating, and incorporating lessons learned in the classroom, and then applying that learning to real life practice situations. In essence, the most effective simulation learning occurs when participants are permitted to experience complex situations that invest them emotionally, and provide them with the opportunity to act, react, and observe consequences of their actions and choices (Wang, 2011).

A key benefit of simulation is that it permits students to visualize a particular situation. According to Campbell, Gantt, and Congdon (2009),

> Visualization is a key component of experiential learning because when people can witness something firsthand, they are in a better position to manipulate the images generated in their mind, thereby enhancing their ability to reflect on what

they have seen, develop hypotheses, and then ultimately test those hypotheses as a way to solve the problem. (p. 9)

Studies of student reaction to simulation indicate that the experience is perceived as positive. Students report that simulation helps to promote self-confidence and a greater appreciation of the complexities of real world events (Bearnson & Wilker, 2005; Mikkelson et al., 2007; Ravert, 2002). In a study conducted by Moule, Wilford, Sales, and Lockyer (2008), students exposed to simulation in a nurse midwifery program found the experience beneficial in helping to improve clinical knowledge and practice. Additionally, students gained insight into the perspectives of colleagues from various disciplines when simulation was undertaken in interdisciplinary groups. Moule et al. (2008) suggest "…if simulations are developed to include a range of health and social care professions, outcomes might support a wider understanding of interdisciplinary and interprofessional practices" (p. 795).

Faculty can employ simulation as a means to evaluate teaching effectiveness and student competence (Becker et al., 2006). Akhtar-Danesh, Baxter, Valaitis, Stanyon, and Sproul (2009) identify four faculty perspectives regarding the use of simulation in undergraduate nursing education: *Positive enthusiasts*, faculty with a positive attitude and belief in the value of simulation; *Supporters*, faculty who view simulation as a strategy to enhance learning; *Traditionalists*, faculty who value face-to-face teaching methods over those offered by simulation; and *Help Seekers*, individuals who see value in simulation but also recognize practical barriers to its implementation. In general, the findings of the study indicate that faculty members in undergraduate nursing programs support simulation but they believe that it cannot be used to replace real-life learning. The

researchers believe that more faculty would embrace simulation as a teaching tool if they were provided with additional support and training (Akhtar-Danesh et al., 2009).

A clear goal and adequate faculty preparation is essential if the simulation experience is to be successful. In their study, Howard, Englert, Kameg, and Perozzi (2011) suggest that simulation across the curriculum should be supported by

> A dedicated simulation coordinator or champion, technological support, adequate facilities, standardized programming forms, funds for supplies that enhance realism, and workload release time for faculty to gain understanding related to the use of this innovative yet highly technical teaching technique. (p. e9)

Garrett, McPhee, and Jackson (2010) suggest that faculty should adhere to specific guidelines when preparing and executing a simulation experience, these include "initial and ongoing assessment guidelines; minimal behaviors to expect; prompts or questions to stimulate problem-solving, and a checklist or systematic debriefing sheet" (p. 310). The researchers also recommend that a debriefing session between faculty and students should immediately follow the simulation experience. Debriefing is essential in order to assure transference of learning and provide students with an opportunity for self-reflection (Garrett et al., 2010; Wang, 2011).

Simulation in Business Education

In the late nineteenth century, with the introduction of case method instruction, Harvard Law School began training students in principles of law through examination of case studies rather than memorization of facts. This new pedagogical technique encouraged students to gather knowledge and understanding of the law by examining court cases and legal decisions. Reasoning and thinking about the practical application of

concepts became the basis for an innovation in legal training ("Langdell, Christopher Columbus (1826-1906)," 1997). This approach to teaching theory by analyzing practice may represent the first advance toward employing simulation methods in the classroom setting (Saunders, 1997). Today, simulation in the form of case studies is a common form of business education, and authors of business textbooks frequently make use of real world examples or model situations to demonstrate theoretical constructs.

The use of simulation in business education exploded in the early 1990s with the advent of computer simulation games that could provide students with the opportunity for experiential learning within the framework of realistic business situations (Saunders, 1997). Faria and Wellington (2004) report,

> Surveys conducted over the period from 1962 to 1998 have reported simulation game usage in one or more courses at AACSB [The Association to Advance Collegiate Schools of Business] member schools has increased from 71.1% in 1962 to 97.5% in 1998. Business game usage was highest in the strategic management/business policy, management, and marketing disciplines. (p. 201)

Simulation tools have been incorporated into the education of various business professions. For example, computerized simulation is used to create spreadsheet models that challenge the understanding and algorithmic thinking of accounting students. According to Marriott (2004), “The main benefit is (that) the use of the computer simulation and spreadsheet models provides a concrete experience of accounting used in a real world context” (p. 68). In a business simulation where students were divided into teams in order to cope with a complex multi-focal business problem, Xu and Yang (2010) determined that “students develop high-order knowledge and problem-solving skills by

synthesizing diverse perspectives" (p. 227). Additionally, undergraduate students exposed to a game simulation designed to model economic principles, gained a firmer grasp of the practical application for theories and concepts that are taught in the classroom setting (Zapalska & Brozik, 2001).

Simulations may contribute to the creation of effective management learning environments (Moratis, Hoff, & Reul, 2006). In a study of the effectiveness of management simulations, Adobor and Daneshfar (2006) determined that learning was positively affected by a number of factors, including the extent to which the participant perceived the simulation as reflective of real-life. Chapman and Sorge (1999) observed that a simulation in sales force management achieved basic learning objectives more effectively than more traditional instructional tools, and Gopinath and Sawyer (1999) found that a computer based enterprise simulation encouraged strategic decision making and promoted group behavior that is consistent with successful strategic planning. In a study of the perceived role of simulation in undergraduate international business education, Farrell (2005) concluded that simulations generated a high degree of interest and involvement among students, and learning from the simulations was perceived to be greater than learning achieved through more traditional teaching methods. In a six-year experiment designed to evaluate the effectiveness of simulations, Frederking (2005) observed that an experimental group of political science students exposed to simulation consistently scored higher on examinations than control groups who did not experience simulation.

When applied in the teaching of law students, Ferber (2002) observed that simulation has the capacity to produce more effective and diverse learning than

traditional Socratic methods. Additionally, the simulations helped students to become more motivated and taught them to evaluate and critique their own work.

Simulation in Healthcare Administration Education

The literature is sparse in the coverage of simulation as a means to train students in the specific field of health administration. Since health administration includes many of the operational factors inherent in general business, it may be possible to extrapolate the benefits of simulation training in general business to that of health care administration education. For example, simulation provides business management students with an opportunity to develop essential competencies, such as communication, cooperation, and collaboration (Cellucci & Moses, 2009). As with other business disciplines, interactive simulation may also aid healthcare administration students to learn the fundamentals of business operations including, teamwork, planning, organizing, leading, and controlling.

Royal (2011) conducted a pilot study using standardized patients to create various scenarios designed to enhance the learning and communication skills of students enrolled in a health administration course at a US university. The researcher approached the study with "the expectation [that] although students would be nervous about participating, they would realize the importance of self-confidence which comes from possessing and practicing the skills needed for the work environment" (p. 170). Study participants found simulation to be a valuable learning experience, a conclusion that supports findings from similar studies conducted with students from other healthcare disciplines.

Simulation in Healthcare Clinical Education

In healthcare, simulation is a generic term used to describe a wide range of methods to mimic real-life situations for the purpose of training students in specific tasks.

According to Grant and Marriage (2012), the development of simulation as an educational tool in medicine "can be viewed as a result of the synthesis of three separate strands: the recognition of the need for practical training, changes in the methods of medical education, and technological developments leading to the manufacture of affordable physiological simulators" (p. 255). In medical education, simulation has emerged as an important means for training students in the skills necessary to engage in safe, effective, and high-quality clinical practice. High technology simulation is used in a variety of ways to help teach and enhance learning in such areas as cardiology, anesthesia, and surgery (Issenberg & Scalese, 2008).

Traditionally, the healthcare professions have relied on real patients to provide training and clinical experience for students. Over the past half-century, advances in medicine and technology have created an environment where these traditional methods are no longer adequate to meet the needs of healthcare education. Changes in delivery models have shortened hospital stays, thereby reducing the numbers of real patients available to students. Additionally, the technology boom has changed the topography of healthcare and resulted in a growing need for quick and efficient methods to train students in the skills necessary to keep pace in a demanding and ever-changing environment (Issenberg & Scalese, 2008).

Through the years, medical simulation techniques have evolved from basic verbal role-playing to advanced technical replication using state-of-the-art computerized equipment. In the 1960s, a life-like mannequin was designed on which students could practice mouth-to-mouth ventilation during training in cardiopulmonary resuscitation. With the advent of advanced technology, the basic mannequin with limited use

eventually evolved into advanced human-patient simulators that could be used to replicate a wide range of complex medical situations (Cooper & Taqueti, 2004). Today, in medical and nursing education, simulation provides students with an opportunity to build core competencies through standard clinical experiences that lack the unpredictability of real-world encounters as well as legal and ethical constraints that sometimes accompany those interactions (Becker et al., 2006; Galloway, 2009).

Studies in simulation learning suggest that simulation in nursing education is primarily employed as a teaching rather than a learning tool. Some nursing programs have integrated simulation into a clinical immersion model; however, in general, simulation tends to be used to coach students in practice skills rather than as a tool to enhance cognitive thinking ability (Diefenbeck, Plowfield, & Herrman, 2006; Kaakien & Arwood, 2009). However, Human Patient Simulation may lead to transformative learning by providing students with unexpected scenarios that spark reflection and discourse (Parker & Myrick, 2010).

High-fidelity simulation may afford nursing students the opportunity to engage critical thinking skills. Although, research indicates that there is a need to take the process a step further by developing simulation scenarios that expand reflective ability, contextual perspective, application of standards, and logical reasoning (Ertmer et al., 2010). Maneval et al. (2012) conducted a study in which high fidelity patient simulation was added to a new nurse orientation program. The researchers concluded that students exposed to the simulation experience did not demonstrate significant improvement in critical thinking or decision-making skills when compared to a control group of students who were not exposed to simulation. In another study, Howard et al. (2011) introduced

high fidelity human simulation as a teaching and learning tool in an undergraduate nursing program. The researchers concluded,

> Although students felt positively that simulation should be included in the curriculum, they did not feel it should totally substitute for all clinical experiences, and students appeared to become more comfortable with simulation as they experienced more scenarios in the curriculum. (p. e9)

Simulation Using "Standardized Patients" in Healthcare Clinical Education

The next step in the evolution of medical simulation is the use of "Standardized patients," actors who are trained to portray patients in realistic scenarios designed to mimic real-life clinical situations. In medical education, standardized patients provide students with an opportunity to interview, examine, and discuss symptoms with actual people who bring with them significant cultural, emotional, and social issues. This added dimension provides students with the opportunity to practice important communication skills as well as clinical technique (Brender et al., 2005). Additionally, standardized patient simulations provide undergraduate nursing students with a learning experience independent of faculty, and can create situations where the student has greater responsibility for the outcome of the scenario (Sideras et al., 2013). In a phenomenological study of the use of standardized patients in art therapy education, Johnson et al. (2013) reported that students subjected to simulation experienced increased confidence levels and reduced anxiety over the fear of making a mistake with a real patient.

Although standardized patients are capable of creating a convincing approximation of real life situations, their true value lies in the fact that they are not

actual patients. Through the use of actors, instructors can create scenarios that are suited to the student's particular level of experience, and students can truly "practice" skills in a safe environment without fear of harming real patients (Gask, Coskun, & Baron, 2011).

When used to teach neurologic examination skills, medical students who were exposed to standardized patient simulation outperformed a control group of students who did not experience the simulation scenario (Safdieh et al., 2011). In an attempt to evaluate health assessment learning using standardized patients, Bornais, Raiger, Krahn, and El-Masri (2012) observed the results of an experimental group of nursing students who were exposed to simulation verses a group of students who received traditional health assessment training. The authors found that the students who were exposed to simulation performed significantly better on the established tests.

In a study where standardized patients were used to teach leadership competencies to nursing students, Sharpnack et al. (2011), concluded that "student evaluations [of the simulation experience] suggest that complex scenarios involving standardized patients provided opportunities for application of leadership principles to realistic patient care experiences and that this method may facilitate student transition to practice" (pg. e8). The authors believed that these findings supported the need for further research into the efficacy of standardized patients in improving the application of leadership concepts.

Barnett et al. (2010) conducted a study to observe the use of standardized patients on the training of interdisciplinary teams of students from various health professions. The researchers concluded that the simulation experience provided students with valuable exposure to interdisciplinary teamwork, a clearer understanding of the various roles

within the healthcare team, and a basis upon which to build more effective interdisciplinary communication. In a similar study, Westberg et al. (2006) determined that pharmacy students engaged in interprofessional activities using standardized patients also found the experience to be useful in increasing understanding of the roles of the various disciplines. Pharmacy students exposed to interdisciplinary simulation using standardized patients found that they gained a greater understanding of the unique perspectives of their colleagues from other professions. However, faculty involved with the pharmacy simulation believed that students were not provided with adequate time to reflect upon the experience (Westberg et al., 2006).

In a standardized patient simulation activity designed to improve therapeutic communication skills in psychiatric nursing students, Webster (2013) suggested that the simulation exercise might be an effective means for students to practice desired behaviors introduced through didactic teaching, and that simulation might be a means to promote a "culture of quality and safety" (p. 648). In the community health arena, standardized patients used to provide a home visit simulation exercise, resulted in an experience for nursing students that promoted active learning, increased satisfaction, and self-confidence (Kim-Godwin, Livsey, Ezzell, & Highsmith, 2013).

Simulation and Critical Thinking

Critical thinking is important for students because it supports a high level of effectiveness in the teaching and learning process; it enhances proficiency in higher order thinking in areas such as history, science, and mathematics (Higher Education, n.d.). Critical thinking is an abstract conceptual skill for which there is no standard model (Weis & Guyton-Simmons, 1998). According to Pascarella and Terezini (1991),

> [Critical thinking] typically involves the individual's ability to do some or all of the following: identify central issues and assumptions in an argument, recognize important relationships, make correct inferences from data, deduce conclusions from information or data provided, interpret whether conclusions are warranted on the basis of data given, and evaluate evidence or authority. (p. 118)

In her examination of various conceptions of critical thinking, Mulnix (2012) observes that improvement of critical thinking skills is directly related to the amount of repetition or practice of those skills.

In a study designed to explore critical thinking skills of nursing students who received high fidelity patient simulation verses those who received low fidelity or traditional case study instruction, Goodstone et al. (2013) determined that there were no statistically significant differences between the groups. In fact, the research revealed that both the high and low fidelity modes of instruction were associated with increases in critical thinking skills. Similarly, Maneval et al. (2012) examined the effect of high fidelity patient simulation on a new nurse orientation program. The authors observed no statistically significant difference in critical thinking skills between students who were exposed to the simulation experience versus those who were not.

Research suggests that additional study is required to investigate the efficacy of simulation in conceptual learning and for improving higher-order thinking and problem-solving skills (Kaakinen & Arwood, 2009). Kneebone (2005) believes that simulation works best in medical education when used as an adjunct to real-world clinical practice. He suggests that simulation training focuses on perceived clinical needs and, therefore, may be limited by the subjective value assigned to it by both teachers and students.

Further, Kneebone (2005) states: "Because individual episodes of simulation-based training give a high sense of immediate satisfaction, it is easy to forget that such skills, however firmly grasped they appear to be at the time, will rapidly decay if they are not consolidated" (p. 551). In a study examining the practice based simulation model as a method to integrate simulation in a manner conducive to teaching critical thinking skills, Park et al. (2013) found evidence to support the value of simulation integrated teaching practices. However, the authors believe that further study is necessary to examine the effect of the practice based simulation model, and to support the correlation between simulation and enhanced critical thinking skills.

Simulation, Critical Thinking, and Experiential Learning

Various studies indicate that experiential learning may enhance critical thinking skills (Clapper, 2009; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010). According to Coker (2010), "experiential learning involves hands-on experience in a practical setting to test information learned in didactic coursework in an actual practice environment" (p. 281). In order to benefit from experiential learning, students must be self-directed and reflective; they must be provided with an opportunity to be active in a learning process whereby knowledge is continuously derived and tested by the learner (Clapper, 2009). Likewise, faculty must create practical experiences that not only foster skills but also enhance understanding. Teaching for understanding requires educators to do more than create realistic fabrications that mimic real life events. Experiential learning addresses higher-order thinking skills by actively engaging students. According to Hamilton and Klebba (2011), "[experiential learning] may well serve to increase

[learning] transferability to the more realistic, intricate situations encountered in a business environment" (p. 1).

Kolb (1984) believes that "learning is the process whereby knowledge is created through transformation of experience" (p. 38); thus, learning is a cognitive process whereby the learner discovers abstract concepts through reflection and eventually employs them in subsequent situations.

> Kolb proposes that experiential learning has six main characteristics: (1) Learning is best conceived as a process, not in terms of outcomes; (2) Learning is a continuous process grounded in experience; (3) Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world; (4) Learning is a holistic process of adaptation to the world; (5) Learning involves transitions between the person and the environment; (6) Learning is the process of creating knowledge that is the result of the transaction between social knowledge and personal knowledge. (Kolb's Learning Styles and Experiential Learning Model, n.d., para. 4)

Experiential learning occurs in a cycle of four stages that must follow each other in sequence. In stage 1 of Kolb's model of experiential learning (Figure 1), the student becomes involved in a new experience; in stage 2 the learner reflects upon that experience from various perspectives; in stage 3, the learner internalizes and develops concepts that logically integrate observations into their own theories; and in stage 4, those theories are used to make decisions (Saunders, 1997). In essence, the model demonstrates how reflection upon concrete experience can lead to the formation of new concepts and ideas, which in turn, forms the basis for new experimentation and learning (Kolb, 1984).

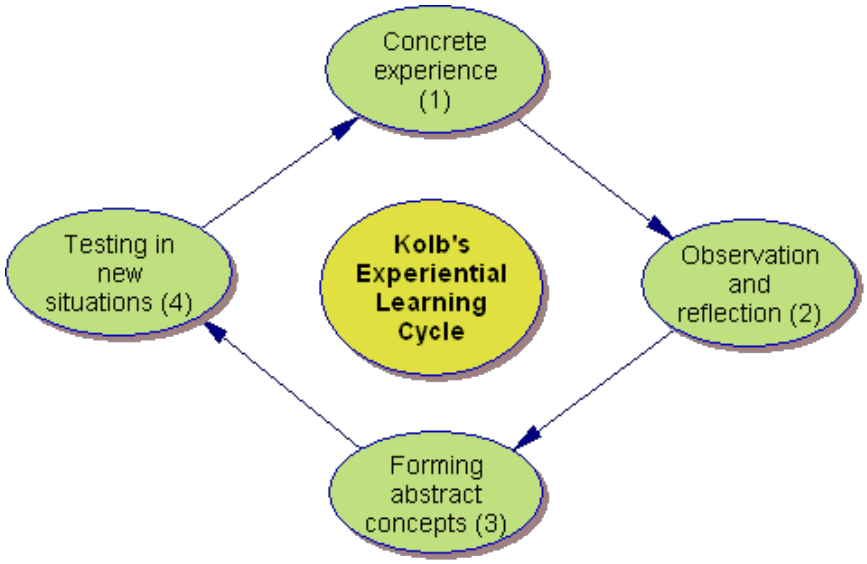

Figure 1. Kolb's model of experiential learning.

Simulation has the potential to provide students with the initial impetus necessary to launch the process of experiential learning. In a study by Lisko and O'Dell (2010), the researchers introduced a method of scenario-based performance in order to evaluate critical thinking skills of nursing students. Results seemed to indicate that "scenario-based evaluation served as an integrator of learning, bringing together theoretical knowledge obtained in the classroom and psychomotor skills learned in the laboratory and clinical practice, requiring students to think critically" (p. 108). Likewise, Saunders (1997) suggests that a new learning paradigm may be emerging in business education. Under this new paradigm, learning becomes student-centered and experiential, replacing the instruction-centered paradigm focused on content and instructors. Simulation may enhance learning through extension and intention by providing students with an

opportunity for controlled external experimentation as well as the chance to acquire learning through internal reflection and abstract conceptualization.

Simulation as a Capstone Experience

The term "capstone" is frequently used to describe a course or final experience used to provide students with an opportunity to consolidate and apply learning acquired throughout a degree program (Acker & Bailey, 2011). In essence, capstones forge a link between academia and real world practice. They have the capacity to integrate concepts, theories, and principles from a field of study into a practical experience that can be used to hone or evaluate a student's skills and mettle. According to Acker and Bailey (2011), capstone courses present a vehicle for embedding graduate skills, such as critical thinking, communication, teamwork, conflict management, decision-making, and personal and intellectual autonomy, into an undergraduate business curriculum.

The use of simulation as capstone experience in a healthcare administration program has not been thoroughly explored in the literature. McCain and Miller (2013) conducted a joint simulation experiment between an advertising/public relation's capstone course and a health communication class. The simulation required instructors to assume the role of problem solving facilitators rather than content experts. Researchers noted no differences in cognitive learning between control groups who did not receive simulation and experimental groups who were exposed to simulation; however, students in the experimental group reported "a greater sense of having experienced something close to the client relationships they would have in the industry after graduation" (p. 10). Additionally, students reported positive outcomes from the simulation experience, but those outcomes were not always those expected by instructors.

In a study that combined traditional teaching models and simulation, Reid, Brown, and Tabibzadeh (2012) were unable to identify an outcome difference in a capstone experience using simulation verses one that employed a traditional term paper. However, the researchers observed that simulation seemed to spark a heightened sense of engagement among students. Additionally, simulation brought to light differences in understanding between instructor and students, and both instructor and students rated the experience positively.

Conclusion

This literature review considers the areas of research germane to the study questions, including the history and applications of simulation learning, critical thinking and experiential learning, and simulation as a capstone evaluative experience.

Simulation is a technique used to provide students with an ersatz real world experience in a laboratory where conditions can be monitored and controlled. The use of simulation in business and healthcare education has gained popularity in recent years, and has progressed from simple case studies to highly realistic fabrications that rely on advanced technology and/or specially trained actors. Healthcare administration, a field of study with roots in both business and healthcare, has not embraced simulation as a means to educate its students.

Studies demonstrate that simulation provides students with a variety of benefits, such as: hands on experience, an opportunity for reflection, and a chance to incorporate accumulated learning into the complexities of the practice environment. In particular, simulation using standardized patients offers students an opportunity to apply leadership skills and gain exposure to interdisciplinary teamwork.

Simulation learning continues to be studied from the perspective of students and faculty. Recent research indicates that students gain confidence from the simulation experience, and appreciate the opportunity to practice skills. Faculty is somewhat more divided between traditionalists, supporters, and enthusiasts; however, simulation continues to garner support from faculty as research continues on the efficacy of simulation techniques on student learning.

The impact of simulation on critical thinking is largely unknown, as studies have yielded inconclusive results, and researchers recommend further study on the subject. However, the connection between experiential learning and critical thinking has been explored and research indicates that experiential learning may enhance critical thinking. Simulation may produce the experience necessary to launch the first three stages of Kolb's (1984) model of experiential learning; therefore, simulation may impact critical thinking through the avenue of experiential learning.

Capstone experiences provide students with an opportunity to consolidate and apply learning. Simulation creates complex situations that require students to draw upon theory and skills gleaned from a variety of sources. The use of simulation as a capstone experience in healthcare administration education has not been thoroughly explored.

The literature review demonstrates that simulation is not widely employed in the training of healthcare administration students, despite the fact that it is well situated in healthcare and business education: that standardized patient simulation provides students with an opportunity to develop leadership and teamwork, skills advantageous in both the business and healthcare environment; that simulation produces experiential learning which, in turn, may stimulate critical thinking; that simulation is not typically used in

health administration capstone experiences; and that simulation may be a tool to achieve experiential and evaluative results typically expected from capstone experiences.

The literature review supports the need for an applied action research study to situate simulation in a healthcare administration program and observe its impact on experiential learning and critical thinking skills of students. Standardized patient simulation is deemed as particularly useful due to the flexibility it presents for the training of business skills such as interpersonal communication, leadership, and teamwork. The need to explore simulation as a healthcare administration capstone experience is also supported, and an applied action research study will render results that can be applied in the practice environment at Centerville University.

Chapter 3

Methodology

Introduction

The use of simulation in business and clinical healthcare education has gained popularity due to its ability to provide students with hands-on experience, as well as a safe environment in which to incorporate theory into practice (Grant & Marriage, 2011; Saunders, 1997). Among its benefits, simulation offers an opportunity for experiential learning which, in turn, stimulates critical thinking; simulation enhances learner confidence, reduces anxiety, and improves interdisciplinary communication (Barnett et al., 2010; Clapper, 2009; Hamilton & Klebba, 2011; Johnson et al., 2013; Kolb, 1984; Lisko & O'Dell, 2010; Sharpmack et al., 2011). Despite its benefits, simulation is not widely used in the training or evaluation of health administration students. The use of simulation in the education of health administration students has not been thoroughly explored in the literature, and the potential affect of simulation on the critical thinking skills of undergraduate students in health administration is unknown. Simulation and its application to the experiential learning process have been addressed in clinical healthcare and business education (Lisko & O'Dell, 2010; Saunders, 1997). The literature lacks any such connection between health administration education, simulation, and the experiential learning process; therefore, this study explored the value of simulation in the training of undergraduate health administration students.

This chapter addresses the methods used to design, implement, and evaluate an action research study to observe how a simulation experience impacts the critical thinking

disposition of students in the undergraduate health administration program at Centerville University, and examine the efficacy of simulation as a programmatic evaluative tool.

This study takes into consideration the prior research on simulation as an effective learning tool, the efficacy of simulation in training students in healthcare and business professions, and the affect of simulation using standardized participants on the critical thinking disposition of students in a health administration program. The result is a research effort designed to determine if a relatively new and evolving instructional method can be expanded for use to a broader healthcare student population.

The following research questions guided the study:

1. How did simulation through the use of standardized participants impact the critical thinking disposition of undergraduate health administration students at Centerville University?
2. What were students' perceptions of the impact of a simulation experience on their own critical thinking skills?
3. What were faculty perceptions of the efficacy of simulation as a training tool for undergraduate students in the health administration program at Centerville University?
4. How can simulation be effectively used to evaluate conceptual and technical competencies at the conclusion of the undergraduate health administration program at Centerville University?

Research Design

> Research methodology is a strategy or plan of action that shapes our choice and use of methods and links them to the desired outcomes. (Baum, MacDougall, & Smith, 2006)

Action research methodology was chosen as a vehicle to achieve the research objectives because the study was practice oriented; it was driven by needs of practitioners at Centerville University, and dependent upon cooperation and involvement of those practitioners. The study involved placing students in a simulation experience where they were expected to draw from various sources of learning in order to manage a given situation. The simulation, while predetermined and controlled, allowed for a measure of unpredictability related to the student's actions and reactions to elements of the scenario. Due to the pragmatic nature of the research, I sought a flexible methodology that would be suitable for a dynamic practice environment, and would permit alterations in the study plan based on ongoing observations.

According to Kidd and Kral, 2005, "participatory action research is a dynamic process that develops from the unique needs, challenges, and learning experiences specific to a given group" (p. 187). Action research is sensitive to emerging needs and changing situations; it is participative in nature and has the potential to involve subjects as co-investigators in the research process and to draw on a range of qualitative and quantitative methods to achieve its goals. Action research is conducted in steps to identify meaningful issues in a specific practice environment. It involves collecting data locally using relevant, valid methods, and analyzing and interpreting that information in an unbiased fashion (Baum, MacDougal, & Smith, 2006). According to Argyris and Schön

(1991), action research is practice-oriented: "It builds descriptions and theories within the practice context itself, and tests them there through intervention experiments – that is, through experiments that bear the double burden of testing hypotheses and affecting some desired change in the situation" (p. 86). Action research includes both quantitative and qualitative methods. It is conducted in formal cycles and each cycle considers the philosophical and pragmatic aspects of an issue, and presents an avenue for channeling this learning into a concrete *plan* for improvement and an *act* to implement the plan. The researcher observes and reflects upon the findings of each cycle, and adjusts the plan and subsequent actions according to accumulated learning. The result is an active process that increases the researcher's insight into the research questions (Herr & Anderson, 2005). Action research culminates with the development and implementation of a plan of action based on results of the research (Callison, 2007). In action research, qualitative and quantitative data can be used in a complimentary fashion to achieve the study goals; although, study participants often interpret the resulting information qualitatively.

The aim of this study was to observe the impact of a simulation experience on critical thinking disposition of students in the undergraduate program at Centerville University. A true experimental design appeared appropriate for such research where, under ideal circumstances, the researcher would test the impact of an intervention while controlling outside influences. Creswell (2009) states,

> As one form of control, [in true experimental design] researchers randomly assign individuals to groups. When one group receives a treatment and the other group does not, the experimenter can isolate whether it is the treatment and not other factors that influence the outcome. (Creswell, 2009, p. 154)

Unfortunately, in complex situations, particularly in healthcare, it is often impossible for a researcher to fully manipulate and control outside factors that might influence outcomes. In such situations, a quasi-experimental design may be used to investigate causal relationships. Quasi-experiments do not meet the requirements of randomization and control inherent in experimental design, but they employ similar analyses, and they make use of a manipulated independent variable compared to one or more dependent variables (Behi & Nolan, 1996).

Factors at Centerville University, such as group size, composition, availability of subjects, and scheduling issues related to the simulation facility made randomization impractical. These factors also made impractical the establishment of randomized experimental and control groups of subjects, as required in traditional experimental research; thus, a non-equivalent control group design was used (Salkind, 2000). Like true experimental design, quasi-experimental research makes use of qualitative and quantitative data to achieve its goals; however, quasi-experimental research lacks random assignment of subjects that is inherent in experimental design (Dimitrov & Rumrill, 2003). A non-equivalent control group design, structured like a traditional pre-test/post-test experimental design but lacking randomization, permits an experimental group to be measured on a dependent variable both before and after manipulation of the independent variable, while a control group is measured only on the dependent variable. (Quasi-Experiments, n.d.). In the case of this study, critical thinking (dependent variable) was measured before and after a simulation experience (independent variable) in an experimental group. The dependent variable was measured in a control group that did not experience simulation.

Experimental and control groups of subjects were established by asking for volunteers from the group of students enrolled in the undergraduate health administration program at Centerville University. Although I had some control over the independent variable, it was not possible to control all of the extraneous variables, or outside factors that might affect the outcome of the experiment – for example, subjects may have been at different academic levels, or variations may have existed in the abilities of the participants with respect to communication skills, or understanding of the principles of group dynamics.

The inherent weakness of quasi-experimental design is that it lacks randomization and, therefore, may yield uncertain results relative to the cause and effect relationship between dependent and independent variables. To help mitigate this uncertainty, I chose a multi-source data collection strategy where data were collected through various methods, and then compared to examine convergence, difference, or combination (Creswell, 2009).

Data Collection Strategies

The following data collection strategies were used to achieve the research goals.

The California Critical Thinking Disposition Inventory (CCTDI). In order to measure the dependent variable, I chose an established data collection instrument, *The California Critical Thinking Disposition Inventory* (Appendix A). According to Insight Assessment (2015), "The CCTDI is specifically designed to measure the disposition to engage problems and make decisions using critical thinking" (p. 15). The instrument contains 75 questions rated on a Likert scale and designed to measure seven attributes typically associated with strong critical thinking skills – Truth seeking, analyticity, open-mindedness, systematicity, confidence in reasoning, inquisitiveness, and maturity in

judgment. CCTDI measures an individual's disposition to engage problems and think critically.

> High scores on the California Critical Thinking Disposition Inventory are positively correlated with a strong desire to apply one's critical thinking skills in decision making and problem solving, with leadership, with ego resilience, and with the capacity to benefit from educational training and psychological counseling. (California Critical Thinking Disposition Inventory, n.d., para. 2)

Questionnaires. A questionnaire is an efficient tool to obtain information and collect data from respondents; it is generally a written document that may be presented in a structured fashion where all participants are asked the same questions, or an unstructured fashion where questions are varied at the discretion of the researcher (Kazi & Khalid, 2012). Questionnaires present questions in a clear, bold fashion that decrease ambiguity and allow respondents ample time to formulate a cohesive response (Wilkinson & Birmingham, 2003).

For this study, I developed a written questionnaire consisting of five open-ended questions for simulation subjects to complete after experiencing the simulation, and a written questionnaire consisting of four open-ended questions for faculty to complete after observing a simulation (Appendix B). Subjects were given a private area and as much time as they needed to complete the questionnaires. Data from the questionnaires were used to gather information on a subject's perception of the simulation experience and its affect on critical thinking, as well as faculty perceptions of the strengths and weakness of simulation as an evaluative tool.

Semi-structured interviews. Interviews are a method of data collection that provides the researcher with the opportunity to collect detailed information about a particular experience in a face-to-face interaction. In a semi-structured format, the interviewer directs the discussion toward a particular topic through the use of some predetermined questions, but the interviewee is permitted to take an active role in establishing the flow of the interaction (Wilkinson & Birmingham, 2003). According to DiCicco-Bloom & Crabtree (2006), "[semi-structured interviews] are generally organized around a set of predetermined open-ended questions, with other questions emerging from the dialogue between interviewer and interviewee" (p. 315). The semi-structured interview has its basis in conversation and has the potential to uncover hidden aspects of human behavior (Qu & Dumay, 2011). Ideally, data collected from interviews are analyzed concurrently with other forms of qualitative research in order to hone questions and facilitate an emerging insight and understanding related to the study goals (DiCicco-Bloom & Crabtree, 2006).

I conducted a semi-structured debriefing interview with each simulation subject immediately after the simulation experience. The interviews unfolded in a conversational manner without formality or predetermined questions. Subjects were encouraged to comment on their experience and discuss impressions as well as feelings or concerns about the simulation; their comments set the tone and direction of the post-simulation interaction. I kept notes on the debriefing interviews in order to collect qualitative data.

Participant observation/field notes. Participant observation is a tool of qualitative research that is used to study the perspectives of a population within the confines of their own environment; it is particularly useful in helping the researcher to

discover the interplay of various components of a situation. According to Mack et al. (2005), "the researcher engaged in participant observation tries to learn what life is like for an insider while remaining, inevitably, an outsider" (p. 13). Participant observation is documented through field or observational notes taken by the researcher in order to provide a rich account of a particular situation. These observations can be descriptive – describing in detail the specific occurrences during an event, or reflective – recordings of particular insights that the researcher might have regarding any aspect of the event (Efron & Ravid, 2013).

In this study, I observed each simulation experience from a private observation room in the simulation laboratory. Subjects knew they were being observed, but they could not see or communicate with me during the simulation experiment. I watched proceedings closely from beginning to end, and kept detailed descriptive and reflective field notes on all aspects of each simulation, including but not limited to, student reaction, faculty reaction, actor performance, and logistics. Through participant observation and field notes, I gained a fuller understanding of data collected through other methods, and uncovered issues that may not have been known at the outset of the study (Mack, Woodsong, MacQueen, Guest, & Namey, 2005).

Context of the Study

Centerville University is a private research university located in the inner city of an east coast state. According to its published materials, Centerville University is top ranked in the nation and boasts an overall enrollment that exceeds 25,000 students. Centerville prides itself on a reputation for experiential learning that combines technology, best practices, and research. The university has a long history of providing

healthcare education to a wide range of disciplines, including healthcare administrators. The health administration program at Centerville is housed within a university college that provides education for a variety of health disciplines. The undergraduate health administration program has a diverse student population and has experienced steady enrollment increases year-over-year for the past five years. Students enrolled in the health administration program attend classes either online or in-person, and the majority attend school part-time while working full-time. Of the population of students, 45% are white, 39% are African American, and 7% are Asian or Pacific Islanders. The university does not keep hard data on the gender or age breakdown of students in the health administration program. The healthcare administration faculty at Centerville is 100% white, and 30% female; age statistics are not available. Critical thinking skills are considered to be a centerpiece of the Health Administration Program at Centerville University, and the health administration faculty seeks to develop a capstone course designed to integrate and evaluate student learning at the conclusion of the program.

Centerville University has incorporated the use of simulation into the clinical training of nurses and other health professionals, but simulation is not employed in the education of health administration students. This research will demonstrate how simulation, an instructional method already in use at Centerville University, may impact the critical thinking skills of undergraduate health administration students, and observe faculty perceptions of the efficacy of simulation as a tool to evaluate conceptual and technical competencies.

Selection of Participants

With permission of Centerville University and the chair of the department of health administration, approximately 329 students in the undergraduate health administration program at Centerville University were eligible for inclusion in the research study. Students were invited and encouraged to participate, but participation was not required. Ultimately, eight student subjects participated in simulation in the experimental group and 16 subjects participated in the control group. All eight of the full-time faculty members in the health administration department at Centerville University were invited to participate in the study. Six faculty observed simulations and completed questionnaires.

Worldview and Conceptual Framework

According to Koltko-Rivera (2004):

> Worldviews are sets of beliefs and assumptions that describe reality. A given worldview encompasses assumptions about a heterogeneous variety of topics, including human nature, the meaning and nature of life, and the composition of the universe itself, to name but a few issue. (p. 3)

The process of developing a conceptual framework for this applied action research study began with a survey of various educational theories, and consideration of the merits of each theory with regard to its capacity for drawing together the pragmatic aspects of the research, as well as its capacity to elucidate connections between practice and critical thinking. The result is a research study that encompasses a social constructivist worldview. According to Creswell (2009), constructivism requires an understanding of subjective meaning through understanding of the views of participants.

Constructivism is a socially based process where participants create meaning as they engage in the experience at hand. Simulation using standardized participants engages students in multiphasic interactions with a diverse set of individuals who work together or separately to accomplish a shared goal. Despite its social potential, the simulation experience is personal. Thus, in order to discover value or meaning in simulation, it is necessary to examine simulation through the lens of individual perspective, which derives from learning and interaction with the environment. This study takes into consideration the perspective of student participants who will reflect upon simulation with respect to their own critical thinking skills, as well as the observations of faculty who will evaluate simulation as a tool for programmatic assessment. I believe that various theories, such as Humanism, Cognitive Development, Behaviorism, Social Psychology, and Social Learning Theory, offer some insight into the educational processes alive in the simulation experience, and that the combination of theories can be used as a prismatic lens to view the efficacy of simulation, and to situate simulation as a powerful and diverse educational tool that can provide experiential learning in a controlled environment and, thus, impact the critical thinking skills of students.

Of primary importance is humanism. On a personal level, I believe that continuous learning is a means for self-fulfillment, and that individual creativity and potential must be nurtured. Humanism is a philosophy that values human beings and critical thinking over theism. Abraham Maslow was a psychologist who pioneered humanistic psychology, a field of study that places value on the individual's creativity, will, and potential. The basic principles underlying humanistic psychology hold that current performance is more significant than past or future functioning; individuals must

take responsibility for their own actions; negative actions do not negate the value of a human being; and personal fulfillment can only be achieved through self-improvement. Simulation provides students with an opportunity to practice in a safe environment where they are responsible for outcome. Studies have demonstrated that exposure to simulation helps students to develop self-confidence, and gain a greater appreciation for the complexities of real world situations (Mikkelson et al., 2007; Ravert, 2002).

Simulation provides an opportunity for cognitive learning as students draw from various sources to develop and experiment with models of thinking and behavior. It allows for observation, but at the same time provides the hands on practice that reinforces positive behaviors. As an educator, I am committed to observation and experimentation as essential learning tools as described in cognitive development theory. Cognitive development theory is concerned with learning through information processing using neuro-scientific and psychological resources, such as conception, perception, and language. Jean Piaget was a developmental psychologist who believed that the initial intuitive reactions of children would give way to more scientific and socially acceptable responses when those initial ideas where challenged by those who were more advanced. In essence, Piaget theorized that learning results from experimentation with mental models and the actions that result from those ideas and beliefs (Smith, 1996).

Behaviorism is concerned with observable behaviors of individuals engaged in some activity rather than internal processes that motivate those behaviors, and to motivating behavioral change through repetition and reinforcement. BF Skinner, a radical behaviorist, believed that change could be achieved through repetition of desired behavior, and that significant change might be promoted through a single reinforcement

of desirable actions (Ely & Plomp, 1996). He maintained that lasting change is obtained through a series of small modifications to behavior that occur over time. Skinner advocated the use of mechanical devices to support behavior in the classroom (a precursor to computers); he was an avid proponent of positive reinforcement, and believed in the value of cooperation over competition (Ely & Plomp, 1996). The opportunity for repetitive behavior is inherent in simulation, as students practice skills in a quasi-real environment that can employ technical, mechanical, or human interface to foster learning.

As a business and healthcare professional, I value the connections between environment and change as described in social psychology theory. Social psychology is an interdisciplinary science that bridges the gap between psychology and sociology; it is concerned with observing how behavior is influenced by the presence of other people, and the conditions under which those behaviors occur. Kurt Lewin was a social psychologist that did pioneering work in the areas of group dynamics, experiential learning, and action research. Lewin postulated that behavior results from the interconnection of a person with his environment, and that change occurs through a process of unfreezing (divesting of an established mindset), altering behavior, then freezing (internalizing a new mindset) (Burns, 2004). Simulation provides students with the opportunity to gain firsthand experience with clinical and interpersonal scenarios that intermix to create a complex environment.

Simulation allows students to operate in a social, multidisciplinary, environment where they may observe the behaviors of other professionals. As a leader, I believe in the essential nature of modeling, as described by Bandura in social learning theory. Social

learning theory postulates that learning is not a behavioral process, but rather, a cognitive process that occurs in a social environment. According to the theory, learning can occur through observation or direct instruction that results in a decision about a particular behavior. Albert Bandura is a psychologist who believes that modeling is an important aspect of social learning theory, and that models can stimulate new behavior and fuel change in an organizational setting (Social Learning Theory, n.d.).

Kolb's theory of experiential learning was chosen as an overarching conceptual framework to guide this applied action research study because of its ability to incorporate essential elements from the areas of humanism, cognitive development, behavioral theory, social psychology, and social learning theory (Figure 2) -- the result is a constructivist framework whose essential elements are rich in diversity and well grounded in established research. Kolb's theory of experiential learning relies on a process of experience and reflection that ultimately leads a learner to internalize concepts, develop personal theories and, finally, to act upon the learning (Akella, 2010). Essentially, the model

> Rests on six assumptions, that learning (a) is a process; (b) derives from experience; (c) is a dialectic process; (d) is holistic and integrative; (c) is an interplay between an individual and the environment, and (f) results in knowledge creation. (Akella, 2010, p. 101)

In higher education, learning derives from engaging students in a process whereby they receive feedback on their own learning efforts. The student must examine, test, and refine his own ideas through a process of thinking and action. Experiential learning involves more than the understanding of concepts, it stems from integration of thoughts,

emotions, perceptions, and behaviors to develop a means for problem solving and decision-making. The interactions between an individual and his environment stimulate learning and influence future choices and behaviors; thus, social knowledge is created and recreated within the learner (Kolb & Kolb, 2009).

Simulation has the potential to provide the initial impetus necessary to launch the process of experiential learning in the four stages described by Kolb. The hands-on simulation provides a concrete experience (stage 1) that requires the student to integrate learning from various sources and reflect upon options (stage 2), integrate learning into personal theories (stage 3), and make decisions (stage 4) (Kolb, 1984).

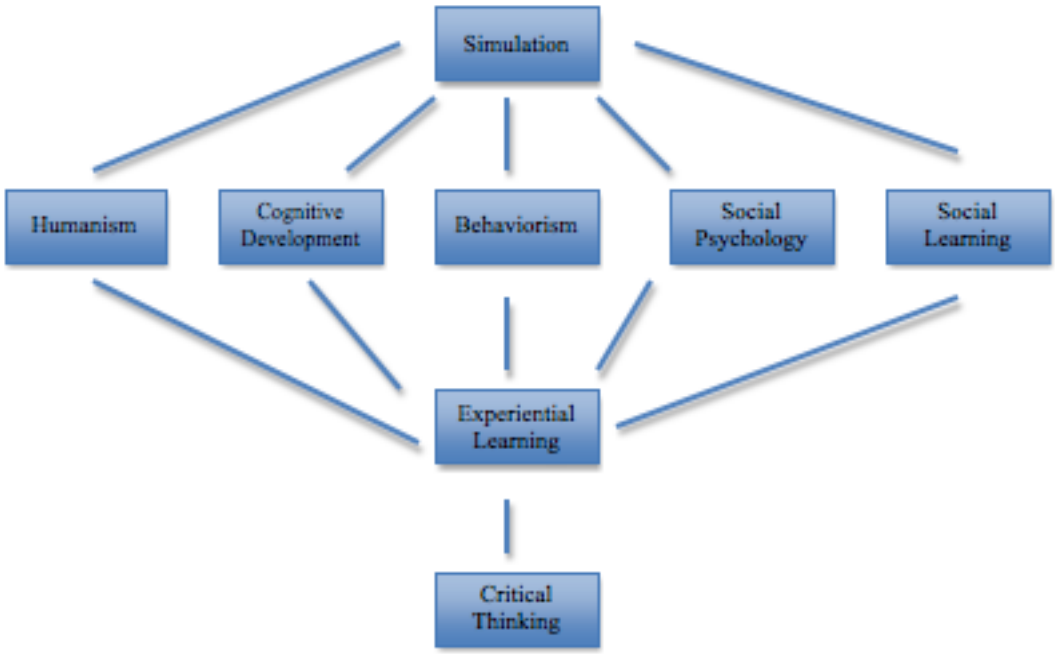

Figure 2. Simulation/experiential learning model.

Outline of Action Research Cycles

Study research will be conducted in the following cycles:

Cycle 1 – Planning the study. In the first phase, I determined the desired outcome for a simulation experience and designed a simulation scenario accordingly. In this case, the goal of the simulation was to challenge students' ability to assess an existing team in a mock professional setting, observe and assess individual members of the team, and draw conclusions with regard to efficiency of the team process and needs of individual members. A simulation scenario was designed to accomplish the goals of the study. A backstory for a fictional facility was developed, along with characterizations and backstories for each of the players (Appendix C). The scenario needed enough detail to provide the actors with the understanding and motivation necessary to be effective in their assigned roles.

The next step was to find and train actors who are capable of playing the roles, and who were comfortable with the scenario and expectations of the experiment. Actors had a character backstory and motivation that had been predetermined, but the students' improvisations varied based on factors such as personality and ability; therefore, the actors needed to be prepared to cope with a measure of unknown as each simulation experience evolved. For this experiment, I chose actors from the pool available at Centerville University. The selection process included a frank discussion regarding expectations. I worked with each actor individually to fully develop the characters and assure the actor's comfort and understanding of the process and goals of the research. As a final step in the training process, the actors met as a group to help ground the scenario prior to implementation of the study.

The research required use of the simulation laboratory "conference room" available at Centerville University. The simulation conference room was outfitted with a conference table and chairs, as well as discreet cameras and microphones so faculty could observe the proceedings as they occur. At this point, I anticipated that the study would require approximately 16 hours of laboratory space, which would be scheduled through established procedures at Centerville University. In this stage of the research, student and faculty roles were described, as well as practice and learning objectives for students and objectives for faculty participation (Appendix C); interview protocols were also developed (Appendix B), and approval was obtained for use of the *California Critical Thinking Disposition Inventory* as a pre- and post-test (Appendix A). Finally, a plan was developed and implemented to recruit study subjects from the pool of undergraduate students in the health administration program at Centerville University for experimental and control groups; a plan to recruit faculty participants from the health administration program at Centerville University was also developed and implemented.

Conclusion of Cycle I. Cycle I concluded when logistical plans for the research were finalized and subjects were recruited for the study.

Cycle II – Implementing the study. In Cycle II, the simulation experiment was implemented in accordance with the research design. Members of the control group took the *California Critical Thinking Disposition Inventory*. Each subject in the experimental group took the *California Critical Thinking Disposition Inventory* as a pre-test and was briefed on the background scenario; however, character motivations were not revealed to the participant. Next, the subject in the role of a new administrator entered the conference room for a scheduled meeting with a group of "managers." In a scenario that was

expected to take 15 minutes, the subject was expected to proactively manage and facilitate the meeting, encourage feedback, respond positively to feedback from each character, and close the meeting on a positive note. At the conclusion of the experience, feedback was exchanged in a debriefing interview between the subjects and me; the subjects were asked to assess each character with regard to motivation, and to begin to formulate a strategy for future interactions with that character. Finally, subjects in the experimental group took the *California Critical Thinking Disposition Inventory* as a post-test and completed a questionnaire designed to collect data on the participant's perception of the experience.

Throughout the experiment, I collected qualitative data through descriptive and reflective field notes. At the conclusion of the simulations, faculty completed a questionnaire designed to collect data on faculty perception of simulation as a tool to evaluate the conceptual and technical competencies of students (Appendix B).

Conclusion of Cycle II. Data from the cycle were collected and collated.

Cycle III – Data analysis. In the final research cycle, data were analyzed using a concurrent triangulation approach where data collected through various methods were compared to examine convergence, difference, or combination (Creswell, 2009). Qualitative data were collected from my observations of the simulation experiments, subject questionnaires, and subject interviews in order to address subject perception of the simulation experience and its impact on critical thinking. Qualitative data were also collected from faculty questionnaires to examine faculty perceptions of the simulation experience as an evaluative tool. Quantitative data were collected through the *California Critical Thinking Disposition Inventory*.

Qualitative data from field observations were transcribed and organized. Questionnaires from the experimental group of subjects were broken down so that answers to each question could be examined individually. Data collected from subject interviews were transcribed and examined for themes. Qualitative data were then examined in the aggregate to observe for common themes. Quantitative data from the pre- and post-test were examined to observe for variations in critical thinking disposition before and after the simulation experience. Qualitative and quantitative data from the experimental group were then examined together to observe for common themes. Quantitative data collected from the control group were then examined and compared with data from the experimental group to observe for variations or themes. Finally, data from faculty questionnaires were broken down so answers to individual questions could be examined individually and common themes noted.

The research questions were addressed individually and collectively through the following methods:

Research question 1. How did simulation through the use of standardized participants impact the critical thinking disposition of undergraduate health administration students at Centerville University?

Student pre-test. The *California Critical Thinking Disposition Inventory* was used to observe critical thinking skills prior to the simulation experience in the experimental group. A control group of subjects took the CCTDI without undergoing simulation.

Simulation experience. Subjects in the experimental group participated in the simulation experience.

Student post-test. The *California Critical Thinking Disposition Inventory* was used to observe critical thinking skills in the experimental group post simulation experience.

Field notes. I observed the simulation and maintained descriptive and reflective notes.

Research question 2. What were students' perceptions of the impact of a simulation experience on their own critical thinking skills?

Interviews. I met with subjects after the simulation experience in order to debrief and exchange feedback.

Field notes. I maintained descriptive and reflective notes.

Student questionnaire. Subjects completed a post-simulation survey.

Research questions 3 and 4. What were faculty perceptions of the efficacy of simulation as a training tool for undergraduate students in the health administration program at Centerville University? How can simulation be effectively used to evaluate conceptual and technical competencies of students at the conclusion of their undergraduate health administration program at Centerville University?

Faculty questionnaire. Faculty completed a post-simulation survey.

Conclusion of Cycle III. The study report was produced and presented to the faculty at Rowan University.

Researcher's Disclosure

I am a full-time faculty member in the undergraduate health administration program at Centerville University, where I have been employed 18 months. For two years prior to tenure as full-time faculty, I held a full-time administrative role in the college that

houses the health administration program. Since 2005, I held an adjunct faculty position in the undergraduate health administration program concurrently with other employment. At no time have I held decision-making authority over the health administration program, its leaders, or its staff.

Reliability

The issue of reliability or trustworthiness is addressed through a process of establishing credibility (confidence in the findings), transferability (applicability in other contexts), dependability (consistency and repeatability), and confirmability (absence of researcher bias) (Shenton, 2004). I have addressed these standards through rigorous application of appropriate qualitative research tools necessary to accomplish the goals of the study in a transparent fashion.

The research is credible because it addresses the concerns of practitioners who are personally involved in the research, and the research questions are practice oriented. To address the issue of transferability and dependability, I conducted this research in a practice environment, and designed data collection strategies specifically to yield the level of detail necessary to answer the research questions and address the practice issues, and I made every effort to clarify my assumptions and describe the research context in detail. I addressed confirmability by using a triangulation approach to data collection and interpretation, and by using evidence from various data sources to develop a coherent justification for my observations and conclusions. Finally, I documented all procedures fully, and made every effort to avoid human error in collection or transcription procedures (Lincoln & Guba, 1985; Salkind, 2000: Shenton, 2004).

Conclusion

This chapter addressed the methods used to design, implement, and evaluate a research study to observe how a simulation experience impacts the critical thinking skills of students in an undergraduate health administration program at Centerville University, and examine the efficacy of simulation as a programmatic evaluative tool. Applied action research was chosen as a method for the study due to its philosophical compatibility with my worldview, as well as its pragmatic value in providing an action plan to address a need identified by the faculty in the undergraduate health administration program at Centerville University. In this section, I outlined the data collection strategies and analysis procedures, as well as the three action research cycles employed in the study: Cycle I outlined details of planning the study, Cycle II addressed implementation of the study, and Cycle III provided information on data analysis procedures.

Chapter 4

Cycle I – Planning the Study

Introduction

The purpose of this study was to observe the impact of a simulation experience using standardized participants on the critical thinking disposition of undergraduate students in the health administration program at Centerville University. Further, the study addressed the needs identified by faculty in the health administration program at Centerville University for a means to promote critical thinking skills of students, and to effectively evaluate conceptual and technical learning acquired in the undergraduate program (Centerville University, 2008). Simulation is gaining popularity in the education of business and clinical healthcare students because of its ability to create the opportunity for experiential learning and, thus, enhance critical thinking (Hamilton & Klebba, 2011; Kolb, 1984).

According to Insight Assessment (2015), "Critical thinking is purposeful, reflective judgment focused on deciding what to believe or what to do" (p. 9). It enhances proficiency at higher order thinking (Higher Education, n.d.) and involves the ability to identify assumptions, recognize relationships, make inferences, deduce conclusions, and interpret and evaluate evidence (Pascarella & Terezini, 1991). Simulation using standardized participants provides students with an opportunity to practice skills and techniques (Brender et al., 2005), and may enhance critical thinking by presenting the opportunity for repetition or practice (Mulnix, 2012). In turn, this experiential learning may promote understanding of abstract concepts and engage students in a process whereby knowledge is achieved and tested (Clapper, 2009), and where the learner

internalizes concepts and integrates observations in order to form his own theories (Saunders, 1997).

The objective of Cycle I was to develop and organize a simulation experiment that could become the basis for addressing the research questions. I chose to employ action research as a methodology for this study. Action research is practice oriented and draws from a range of quantitative and qualitative data to accomplish its goals (Argyris & Schön, 1974). I believed that action research presented a perfect vehicle for this study because, by nature, it permits concrete data to be channeled into planning, followed by action to address a real issue – in this case I could observe the impact of simulation on critical thinking disposition as well as faculty perceptions of simulation. In the end, I could answer specific research questions related to the impact of simulation on the subjects' critical thinking disposition and collect data on faculty perceptions relative to the efficacy of simulation as a training and evaluative tool (Argyris & Schön, 1974; Herr & Anderson, 2005). Two groups of subjects participated in the experiment: An experimental group took a critical thinking pre-test, underwent the simulation, and then took a critical thinking post-test and completed a survey (Appendices A and B); a control group of subjects took the critical thinking test only (Appendix A). Faculty observed the simulations and completed a post-experiment survey (Appendix B). Data were collected from the study instruments as well as my observations and field notes.

The nature of this practice-oriented research required the use of a simulation laboratory, live actors, student subjects, and faculty participation; additionally, it was necessary to secure an instrument to measure critical thinking disposition, and to develop a means for collecting data on student and faculty perception of the simulation

experience. Each element presented its own challenge, and a high degree of coordination was necessary in order to manifest each of the required research components within constraints imposed by time schedules and the availability of other resources.

The Simulation

I approached this research with the belief that educational theories such as humanism, cognitive development, behaviorism, social psychology, and social learning could be used to understand how simulation enhances critical thinking. I believed that simulation encompasses a social constructivist worldview where participants are provided with the opportunity to derive meaning as they engage in realistic interactions in a safe and controlled environment (Creswell, 2009). It permits practice and reinforcement of skills acquired in the classroom, as well as an opportunity for learning through doing (Ely & Plomp, 1996). I wanted to create a standard experience for all subjects in the study, but one that could move in unpredictable directions depending upon choices made by the subject (Burns, 2004). I envisioned an experience in a social setting that would permit subjects to employ critical thinking and individual creativity, but would require subjects to take responsibility for choices and decisions. These choices and decisions are necessarily of a social nature and, therefore, have the potential to be challenged by others in the environment. I believed that these challenges could lead to cognitive development, as subjects would be afforded the opportunity to experiment with the mental models that resulted from interactions in the simulation event (Smith, 1996). I believed that the simulation could become the basis for true experiential learning that has the potential to enhance critical thinking (Kolb, 1984).

In order to achieve the study goals, I envisioned a healthcare business scenario that would expose subjects to a realistic event where they would be required to address specific known facts as well as cope with some measure of unknown. In this case, subjects would be briefed on the organizational history, but not the backstory and motivation of each character. I hoped to create a multi-faceted, complex, simulation that would effectively invest subjects emotionally and provide them with the opportunity to act, react, and observe consequences of their own actions (Wang, 2011). I wanted a simulation that promoted experiential learning through visualization, and one that could enhance critical thinking skills through experiential learning (Clapper, 2009; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010).

The undergraduate health administration program at Centerville University is heavily focused on the development of leadership and communication skills (Centerville University, 2008); thus, it seemed appropriate to employ these principles as a framework to challenge skills typically associated with critical thinking, specifically, the ability to recognize relationships, make inferences, and deduce conclusions (Pascarella & Terezini, 1991). With these objectives in mind, I developed a leadership simulation scenario wherein the research subject, acting as a new administrator, would interact with various actors playing the parts of department heads in a fictional organization facing a variety of leadership and financial challenges. A backstory was created to outline the organization's history (Figure 3). Sufficient detail was necessary to make the story realistic and to provide support for character motivation and action during the simulation. Three "department head" characters were created with diverse backgrounds, motivations, and agendas, and each was given a backstory to reflect how personal experience with the

fictional organization influenced current attitude and motivation (Figure 4). Since actions of the research subject determine the direction of the simulation, it was necessary for the actors to improvise responses and reactions based on cues from the subject; therefore, sufficient character detail was essential to provide actors with adequate information upon which to build realistic characterizations.

Prior to the simulation exercises, research subjects were provided with the entire organizational backstory, information about their roles, as well as the name and title of the characters. The backstory and motivation of each department head was not revealed. During the simulations, subjects acted as a newly hired assistant administrator who was conducting an introductory meeting with subordinates. The goal of the meeting, outlined in Table 1, was for the subject to observe and assess group interactions and draw conclusions with respect to the overall team process, as well as the needs and motivations of its members. Quantitative and qualitative data were then collected using the established instruments in order to address the impact of simulation on critical thinking disposition. Faculty from the undergraduate health administration program at Centerville University were invited to observe the simulations; and qualitative data were collected from the group to determine efficacy of simulation as a teaching and learning tool in the undergraduate health administration program.

St. John's Place

A Fictitious Healthcare Organization

St. John's Place is a 100-bed long-term care facility in South Philadelphia. The organization has a long history in the community. First opened in the early 20th century, St. John's started as a 300-bed acute care hospital founded to serve the needs of an immigrant population. For many years, St. John's Hospital quietly conducted business without any unnecessary interaction with the outside world. It held fast to a sectarian mission of service above all else; and its patients and staff, mostly members of the service community, were committed supporters of what they considered "their hospital." In the latter part of the 20th century, St. John's Hospital began to fall on hard times. Changes in reimbursement, population shifts, and competition took their toll, and SJH found that it could no longer keep pace in an environment that appeared to be spinning out of control.

In 1995, with bankruptcy looming, Medical Industries, Inc., a for-profit corporation with a reputation for salvaging distressed hospitals, acquired SJH. MI immediately implemented a program of changes designed to save St. John's from closing: Bed capacity was cut from 300 to 200, thirty percent of staff was cut, work processes were redesigned, and the hospital's mission was retooled to reflect Ml's commitment to education, partnerships, and technical advancement. The ensuing changes did save St. John's Hospital from closing. However, the organization began to look very different from the once familiar, altruistic community hospital. The new administrators, with their dark suits and talk of efficiency, implemented a formal budgeting process and required frequent updates on progress toward clinical and business goals. Staff turnover was unprecedented for SJH, but a few loyal workers held steadfast to their commitment to the old St. John's and remained, despite their reservations about the new regime.

As the topography of healthcare continued to evolve, so did the situation at St. John's Hospital. By the early 2000s, changes in the environment were making it impossible for SJH to survive as an acute care hospital. In 2008, Medical Industries, Inc. sold St. John's to Continuum Care, a for-profit, long-term care company with facilities throughout the US. Continuum Care changed SJH's name to St. John's Place and converted it into the 100-bed long-term care facility it is today. With a new mission, new management, and a new look, St. John's is nothing like the once familiar hospital. Once again, there has been a large turnover of staff, but a few managers loyal to the old mission have chosen to stay. Morale is low and there are clear-cut divisions between the old St. John's Hospital staff and the new workers brought in with the latest takeover. For the first time in several years, St. John's Care is operating at a small profit and jobs are relatively secure. A new assistant administrator has just been hired at the center, the third in the last 5 years. The new AM has been charged with designing an initiative to promote collaboration in the workplace

Figure 3. Fictional organization backstory.

Simulation Characters

"Sara Walters" is the Director of Outreach. She has been with St. John's Center for 5 months and is enthusiastic about doing a good job. Sara's attempts to make change have been met with resistance and hostility from staff and other managers. Consequently, Sara is intimidated by her coworkers and does not feel safe in openly expressing her opinions. She remains quiet in meetings, and when pressed for feedback, Sara tends to agree with whoever appears to dominate the discussion. Unbeknownst to the other staff, Sara is actively looking for another job.

"John Rogers" is the Director of Clinical Staff. He has been with St. John's for 25 years, and has lived through all the changes. John is a member of the old guard and remains loyal to the original mission, although he will not say so publically. Instead, John is aggressive in dealings with coworkers; he can be critical, sarcastic and negative, and he has no qualms about expressing his opinions, especially when they differ from those of the current leadership. John has good ideas but he keeps them to himself. He is of the opinion that the current leaders should stew in their own juices.

"Renee Martin" is the Director of Admissions. She has been with the organization for 18 years and, until recently, was a go-getter and highly supportive of the changes at St. John's. Unbeknownst to others in the room, Renee applied for the Assistant Administrator job but was rejected because she lacks the necessary educational credentials. Consequently, Renee has become somewhat sullen and withdrawn; she is angry and no longer feels valued by the organization. Once a motivated and enthusiastic member of the management team, Renee now will agree to almost anything if it will bring an end to the meeting.

Figure 4. Simulation character backstories.

Table 1

Student/Faculty Roles and Objectives

	Student	Faculty
Role	Participates in simulation	Observes simulation
Practice objective	Manages and facilitates a mock staff meeting with actors playing the parts of department heads	
Learning objective	Assesses and evaluates each character, and begins to formulate a strategy for future interactions with that character	Evaluates simulation as a teaching tool, and determines whether or not simulation has the capacity to integrate conceptual and technical competencies learned in the undergraduate health administration program

Simulation laboratory space. The acquisition of simulation laboratory space became more of a challenge than I anticipated. The study required use of a simulation conference room that could be monitored in real time by the researcher and faculty. Initially, I estimated that 16 hours of laboratory space would be adequate to complete the study. With this in mind, I approached simulation laboratory staff approximately four weeks in advance to secure the appropriate space. I found that simulation laboratory space was in high demand at Centerville University and, unbeknownst to me, reservations for its use were typically made one year or more in advance. Since such advance reservations were not made for this research, the study was constrained by the availability of laboratory space. The only suitable block of available time was prior to a semester break, during final exam week, when student schedules were more erratic than usual. Initially, subjects appeared reluctant to commit to the research for fear that the study schedule would conflict with final exams. At this point, it became clear that, while the actual simulations should take no more than 16 hours, the compressed timeframe would not offer subjects sufficient scheduling choices to make participation feasible at a particularly hectic time of year. With this in mind, I revised the plan to include 15-minute simulation blocks over three eight hour days; thus, spreading the experiment out over three days instead of two days, and providing subjects with more flexibility to choose a convenient time to participate. Ultimately, the simulation experiments were scheduled to occur on December 9-11, 2014 in the simulation laboratory at Centerville University.

Actor recruitment. In the next step, suitable actors were recruited and trained to play the parts of department heads. Centerville University employs a cadre of actors

whose job it is to perform in various types of simulation exercises. There is a standard process for recruiting actors at Centerville, which is guided by the university's simulation staff. Initially, the simulation staff asked for a step-by-step description of the simulation scenario, along with the organizational backstory and character descriptions that I developed. That information was then used to select suitable actors who were willing and available to participate in the study. One male and two female actors were chosen for the roles, and one female was selected as an alternate. Alternates are recommended in case a primary actor becomes ill or unavailable on the day of the experiment. In order to optimize resources, it was important to develop a tight schedule for the simulation exercises, and to secure funding and make arrangements for payment of actors prior to the beginning of actor training. All of these details were accomplished with assistance from the simulation laboratory staff.

Actor training. The training of actors occurred approximately two weeks prior to implementation of the study and took 90 minutes of time in total. The simulation staff provided a conference room with a table large enough for a comfortable discussion between the actors and me. The training meeting was informal and there was no specific agenda. I began with a round of introductions followed by a detailed explanation of the research and a step-by-step review of the simulation plan. As actors recounted their simulation experience, I found that they all had participated in marriage-counseling scenarios where, similar to the current study, they were required to improvise and react to leads provided by subjects. Specific comments from the actors included, "oh, we have done this before," "this is very much like the kind of research that Dr. X does." However, upon further discussion, I realized that the marriage-counseling simulations

included specific objectives that subjects were required to attain, and which had been shared with the actors in advance of the simulations. Actors asked questions like "what are they [subjects] supposed to DO exactly," "how will we know when they [subjects] have satisfactorily completed the goals [of the simulation experience]?" Through these questions, it became clear to me that the marriage-counseling simulations differed from those in my study because the marriage-counseling scenarios were built around specific objectives that subjects were expected to achieve. This study had no such objectives; thus, the players would be required to improvise the entire experience. This realization led me to explain this experiment as being more "free-form," so subjects would have an opportunity to "cope with uncertainty," and deal with the "outcomes of their own choices" – specifically, the manner in which the subjects chose to conduct the meeting and respond to concerns of the players would impact the tone and outcome of the meeting.

I provided the actors with the backstory for the fictional organization, as well as the complete description and backstory of each character. The actors found the character stories to be "realistic and complete," "substantive," and "something that could be used to build a great characterization." The actors gravitated toward particular characters and, with my approval, agreed among themselves which role they should each play. Once that decision had been made, the actors became enthusiastic about their roles and began to ask specific questions like, "how does 'Sara' react when 'John' is so negative," "how confrontational should I ['John'] be," or "can 'Renee' reveal why she is disillusioned?" These questions were important because they gave me the opportunity to further explain that these simulations had the potential to move in almost any direction, and were not

constrained by specific teaching objectives for the experience. I stressed the importance of actors using "personal judgment" to help navigate through the experience. For example, characters might choose to reveal more of their personal backstory or react with emotion, if it seemed appropriate to the situation at hand. The training meeting concluded when I was comfortable that the actors understood the simulation and the potential for allowing subjects to lead the meeting in uncertain directions. Actors left the training describing the simulation as "exciting," "a little different from what we're used to," "an opportunity to do something new."

Recruitment of Subjects

Subjects for the experimental portion of the study were recruited from a pool of 329 students in the undergraduate health administration program at Centerville University. Participation was voluntary. Primarily, recruitment was accomplished through email, although, I did rely on faculty and student word-of-mouth to support recruitment efforts. Eligible students were sent several flyers (Appendix D) with study details and a link to a Doodle Poll where they could sign up for a convenient time to participate. Twenty-one students signed up to participate in the research; nine of those did not show up for scheduled appointments, and four were disqualified from the study. The remaining eight subjects underwent the simulation experiment. Faculty from the health administration program at Centerville University was recruited through the use of a flyer (Appendix E) and personal email from me. Six out of eight full-time faculty in health administration targeted for the study agreed to participate in this research.

Twelve subjects for the control group were recruited from the pool of undergraduate health administration students who did not participate in the simulation

experiment. Recruitment for this group was accomplished via email flyer (Appendix D) and word of mouth from students and faculty. The control group completed the *California Critical Thinking Disposition Inventory* without undergoing the simulation experiment; thereby, creating a basis for observing differences in critical thinking disposition that might be related to simulation.

Pilot Study and Videotaping

Initially, I planned to conduct a pilot study in order to test the logistics of the experiment; unfortunately, this was rendered impractical due to unforeseen scheduling and financial issues. Instead, I opted to evaluate logistics and make necessary adjustments during the full study. The details of this process have been incorporated into the implementation analysis in Cycle II. A pilot study would not have been used to test data collection strategies; therefore, its lack does not impact the quality of data collected; however, a pilot study may have been useful to help organize details and streamline execution of the full study.

I planned to videotape the simulations and use the information as tool for future teaching and research. As plans for the study progressed, it became clear that the detailed process of approval, consent, and data storage required for recording would be prohibited by financial and time constraints; therefore, videotaping was not used, and plans were made for faculty and me to observe all simulations in real time.

Data Collection

Once the simulation scenario and characters were in place, it was necessary to develop data collection instruments to accomplish the goals of the study. I chose the *California Critical Thinking Disposition Inventory* (Appendix A) because "The

California Critical Thinking Disposition Inventory is the premier tool for surveying the dispositional aspects of critical thinking. The CCTDI is specifically designed to measure the disposition to engage problems and make decisions using critical thinking" (CCTDI). Additionally, I developed interview protocols for student and faculty subjects (Appendix B), and collected qualitative data through direct observation and field notes.

Cost of the Research

At the next phase of the planning process, it was crucial to estimate cost for the study and determine the availability of financial support for the research. Cost estimates, as well as actual costs, are outlined in Table 2. Simulation laboratory space is provided free of charge to Centerville University faculty for the purpose of research. According to Centerville policy, simulation actors are compensated according to a standard hourly rate of pay ($20/hr); additionally, they receive payment for four-hour blocks of time on the days of the experiment, and for any training time necessary to prepare for the simulation. Other expenses included fees for use of the *California Critical Thinking Disposition Inventory* (CCTDI) used to measure critical thinking, and costs associated with compensation for study subjects. The vendor calculates charges for the CCTDI on a per use basis with a standard minimum requirement. I failed to consider the vendor's administrative charges in the initial cost estimate, resulting in a substantial underestimation of overall cost for the instrument. Subjects were not directly compensated for participation in the study, but members of the experimental group were entered into a prize drawing for a Kindle Fire HD7 that was held at the conclusion of the study. In this case, there was no outside funding available for the research; therefore, I

personally covered all costs. The final cost of the research was $2,830; this represented a 225 percent variance over the original cost estimate.

Table 2

Simulation Costs

	*Estimate	*Actual	*Variance
Lab Costs	$0	$0	0
Actor Compensation	$640	$2,000	+312%
CCTDI	$420	$630	+150%
Prize	$200	$200	0
Total	$1,260	$2,830	+225%

*Rounded to the nearest tenth

Conclusion and Recommendations

Cycle I concluded with a plan to implement a study to address the research questions. During this initial phase, I created the framework for the study by designing a simulation scenario, obtaining laboratory space, training actors, recruiting subjects, obtaining an instrument to observe critical thinking disposition, and developing instruments to collect qualitative data from student and faculty subjects. At the conclusion of Cycle I, essential research tools had been obtained and logistics of the process had been fine tuned to the extent possible without a true pilot study.

This phase of the research presented some unanticipated challenges related to scheduling laboratory space, recruiting subjects, and obtaining funding for the study. As a result, it was necessary for me to make logistical adjustments in midstream. For example, lack of advanced scheduling resulted in the necessity of taking laboratory space during a non-optimal time in the school term, resulting in increased difficulty recruiting student subjects, and rendering a pilot study impractical; additionally, unanticipated expenses related to a study instrument resulted in higher overall cost for the research. For the future, pilot studies are recommended to help reduce the incidence of unanticipated logistical issues. To this end, the initial planning phase should be adjusted to permit scheduling of simulation laboratory space at least 12 months in advance, if possible; and packaged research instruments should be thoroughly explored to uncover hidden or unanticipated costs related to their usage.

Chapter 5

Cycle II – Implementing the Study

Introduction

The objectives of this study were to observe the impact of a simulation experience using standardized participants on the critical thinking disposition of undergraduate students in the health administration program at Centerville University, and to address the needs of faculty in the health administration program for a means to promote critical thinking skills of students, and to effectively evaluate conceptual and technical learning acquired in the undergraduate program (Centerville University, 2008). The goal of Cycle II was to implement the simulation experiment that was designed and planned in the previous cycle, and collect data that would form the basis for answering the research questions. In the experimental phase of the research, all of the simulations occurred over a three-day period, and qualitative and quantitative data were collected from student and faculty subjects through the established instruments. After the experimental phase was complete, subjects were recruited from the remaining pool of qualified candidates for a control group. As with Cycle I, I faced unanticipated challenges in the implementation phase of the study. This chapter will address each step of the implementation in detail and conclude with recommendations for improving the process.

The Simulation Experiment

In Cycle I, a schedule was designed wherein the simulations were organized in 30-minute blocks during the hours of 9:00 a.m. to 4:00 p.m. over three consecutive days, December 9-11, 2014. There was a 15-minute break between each simulation to permit time for the previous subject to complete the post-tests, and allow some leeway for actor breaks or unanticipated issues. The final schedule had 36 slots from which subjects could

choose a convenient time to participate in the experiment. Recruitment efforts in Cycle I yielded 21 subjects who signed up for the research study via the Doodle Poll that was established for the purpose of organizing the study appointments. Immediately upon sign up, I sent each subject an email to confirm the time and date of the appointment. Information regarding study location and cancellation procedures was also provided in the confirmation email (Appendix G).

Day one. On day one, appointments were booked beginning at 9:30 a.m and ending at 4:00 p.m. Actors arrived at 8:00 a.m for a short meeting to help work out final logistical details. For example, the simulation was observed by faculty and me from the control room; therefore, it was necessary to determine what camera angles would provide optimum viewing, and to test sound to be sure that the proceedings were audible in the control room. From the simulation conference room, it was necessary to work out table position and seating arrangement. The actors assisted in a simulation run through to help test the technical equipment. In final preparation for the simulations, the actors spent some time discussing and rehearsing their parts with each other. This final preparatory phase helped to make the simulations more realistic by establishing a natural feel to interactions among the actors.

The simulation laboratory staff provided three private interview rooms with computers and internet access where the research subjects could take the online critical thinking disposition instrument and complete the post-simulation survey. A pre-simulation check revealed that the *California Critical Thinking Disposition Inventory* was not accessible with the credentials provided to me; therefore, it was necessary for me to contact the vendor and establish user access prior to arrival of the first research subject.

A subject information packet was compiled that included an instruction sheet and consent page, background of the fictional organization, synopsis of the simulation scenario, and a post-simulation survey. Table 3 provides a list of the documents in the packet and the specific information that was included on each document. Next, with room locations and other logistical details finalized, I was able to make a specific plan for how each subject would move through the research process. A sample of a planned simulation schedule block is provided in Table 4.

Table 3

Subject Information Packet

Document	Information
Instruction Sheet	General instructions regarding steps in the process, login for CCTDI, and post-simulation survey
Consent Page	Detains regarding background of the study, purpose, procedures, participation, compensation, and confidentiality
Organizational Backstory	History of the fictional organization
Simulation Scenario	Student role, objective, basic information about the characters
Post-Simulation Survey	Instrument to collect qualitative data post-experiment

Table 4

Sample Simulation Schedule Block for an Individual Research Subject

Begin	Activity	Time needed	End
9:00 AM	Greeting & Instruction	5 minutes	9:05 AM
9:05 AM	CCTDI Pre-Test	10 minutes	9:10 AM
9:10 AM	Simulation	15 minutes	9:25 AM
9:25 AM	CCTDI Post-Test & Post-Simulation Survey	20 minutes	9:45 AM

Six faculty members in the undergraduate health administration program at Centerville University agreed to participate in the research as observers of the simulation exercises. Qualitative data on their perceptions of the efficacy of simulation were then collected via a post-simulation survey (Appendix B). In order to allow for maximum flexibility, faculty preferred not to be bound to a set schedule, and each instructor agreed to attend a simulation that was most convenient relative to his/her other commitments. An information packet was compiled and distributed informally to faculty prior to the simulation exercises, whenever possible. Packets were available onsite for those instructors who did not receive them in advance. Table 5 provides a list of documents provided to faculty prior to the simulations.

Table 5

Faculty Information Packet

Document	Information
Study Information	Details about the study objectives and procedures
Organizational Backstory	History of the fictional organization
Simulation Scenario	Student role, objective, detailed information about the characters
Post-Simulation Survey	Instrument to collect qualitative data post-experiment

Day one of the study was cold and wintry and a light snow had begun to fall before dawn; nevertheless, none of the research subjects had cancelled participation in the study. With all of the simulation details apparently in place, the actors and I were ready for the first subject. Ultimately, only four out of nine subjects scheduled and confirmed for day one showed up to participate in the study; none provided advance notice of cancellation, and only one contacted me after the fact to reschedule. One of the participants on the first day was disqualified for not meeting the study criteria. At this juncture, it become apparent that advance commitment to participate did not assure that a subject would actually show up – a realization that created some anxiety since the study was constrained by availability of laboratory time and resources; additionally, resources spent on the study had already been consumed at the start of day one and could not be refunded or reallocated for future research. I contacted subjects who did not show up for

appointments on day one in an attempt to reschedule, and also reached out to subjects scheduled for days two and three in an attempt to confirm appointments.

Subject 1.1. Subject 1.1 was confident, articulate, and poised during the simulation experience. He directed his attention to each character in turn and asked open-ended questions to draw information about personal experience with the organization. Some typical questions asked by subject 1.1 were: "Tell me about your department." "What are your biggest challenges and successes?" "Tell me something about how you came to St. John's and why you stay." The actors were cooperative with the subject, although they did present the attitudes and concerns that were established for each character. In the post-simulation interview, Subject 1.1 claimed that the simulation was "a great experience although it was tough to deal with people who seem to have already made up their minds."

Subject 1.2. This subject is in the process of completing a degree after having served for a number of years in the US armed forces. He takes pride in his military background and credits the armed forces with providing him the training and life experience necessary to face almost any challenge in the civilian world. As a student, Subject 1.2 often references military examples to illustrate his points, and he frequently discusses his military background in conversations with peers and instructors. He is a confident, take-charge individual, whose assertiveness is sometimes intimidating to younger classmates. Throughout his tenure as a student at Centerville, various instructors in the health administration program have worked with Subject 1.2 to help broaden his worldview, and to assist him in developing a less militaristic communication style. These

efforts have met with only some success since the subject believes strongly that a military communication style is efficacious in every situation.

Subject 1.2 approached the simulation with confidence and enthusiasm. He carefully reviewed the pre-simulation information packet and had no questions regarding the experiment. The actors had no knowledge of the subject's background or prior military experience. The simulation began in the usual fashion with the subject entering a conference room where "department heads" were waiting to begin their first meeting with their new manager – the subject in the role of a newly hired assistant administrator. Subject 1.2 seated himself at the conference table and introduced himself by name; he then informed the characters about his military background and explained how the skills and leadership training he received in the military would benefit the fictitious organization. Immediately, one of the characters reacted negatively and accused the subject of making false assumptions regarding the needs of the organization. The character challenged Subject 1.2's management style and expressed concern about a leader who would act on preconceived notions rather than take time to explore the history and culture of an organization before formulating a strategy to initiate change. Much of the ensuing meeting centered on the subject defending his position and trying to explain how he could make a positive impact using skills acquired in military training.

In the post-simulation interview, Subject 1.2 told me that he believed the meeting went extremely well. Despite the conflict, the subject felt that he was in control of the situation and that he had accomplished the goal of initiating a dialogue between himself and subordinates in the fictitious organization. When asked what he learned from the simulation, the subject stated that it became clear that not everyone has the same values

or beliefs regarding military training; therefore, his standard approach to interpersonal communication may not be appropriate in all situations.

Subject 1.3. This subject presented as jovial and friendly. He approached the actors in an open fashion, initially asking for their support and assistance in accomplishing his goals for the organization. The actors reacted skeptically to this approach and questioned the subject about the specifics of his plans; they demanded to know how he, as a new administrator, planned to support THEM. Subject 1.4 was heavily focused on developing relationships with the characters; he spent the rest of the meeting try to make them feel "supported." He frequently used terms like "we're in this together," "we have each other's backs," "we can make this work." In a debriefing interview, Subject 1.3 claimed that the simulation was a good experience, and it "opened his eyes to the fact that some people are just not willing to work together [with managers]."

Subject 1.4. Subject was not a health administration major; therefore, the subject was disqualified from the study.

Day two. There were six subjects scheduled for simulations on the second day of the study; four were signed up from the Doodle Poll, one was rescheduled from the previous day, and another was a last minute add on. Ultimately, only four of the scheduled subjects showed up for the simulation, and only one subject provided prior notice of cancellation. By the second day, it was becoming more obvious that insufficient time had been allotted for preparing and debriefing subjects, and study subjects were taking longer than anticipated to complete the pre- and post-test.

On day two, faculty expressed concern about unanticipated scheduling issues that might prevent them from observing a simulation. Timing was of particular concern since

it was difficult to predict if a scheduled subject would actually show up for the simulation appointment. As a remedy for this situation, I invited faculty as a group to attend a confirmed simulation appointment in late morning on day two of the study. This solution assured that all interested faculty were afforded the opportunity to view a simulation, and it provided me with an opportunity to address questions in a group.

Subject 2.1. This subject was communicative and enthusiastic about participating in the simulation research study. Prior to the experiment, he asked questions about the simulation scenario and engaged me in a discussion regarding the value of simulation as a learning tool for health administration students. Subject 2.1 began the simulation by introducing himself to the characters and engaging them in small talk that eventually progressed to a more serious discussion about pressing business issues. In typical fashion, "John," a character that is somewhat aggressive and acerbic, expressed dissatisfaction with the current administration and asked the subject what he planned to do about specific problems within the fictional organization. Subject 2.1 responded in an upbeat fashion and assured the characters that he was committed to addressing problems, but needed time to evaluate the situation before he could move forward with any change initiatives. "John" continued to challenge the subject, and expressed dissatisfaction with the subject's plan to mull over problems that, he believed, were self-evident and required no lengthy consideration. As the manager, Subject 2.1 found himself confronted with diffusing the negativity brought on by "John's" aggression while still trying to maintain a positive focus and accomplish the goals of the meeting.

At the conclusion of the simulation, Subject 2.1 expressed frustration with the experience. He believed that he had "done everything right" in the meeting and, despite

his best efforts, “John” failed to fall into line in typical textbook fashion. The subject believed that “John” had ruined the simulation by being unrelenting in his negativity; thus, preventing Subject 2.1 from pursing the meeting goals without obstruction. In the debriefing, I spent 30 minutes with Subject 2.1 discussing how the attitudes and behavior of real people are often unpredictable, and how leaders must be prepared to alter their strategies in order to achieve the best possible outcome for all concerned.

Subject 2.2. Initially, this subject expressed feelings of intimidation at the prospect of being observed during the simulation experience. After reviewing the information packet, the subject made comments such as, “You mean you are going to watch me during the whole thing?” Subject 2.2 became more comfortable after assurance from me that the study was being conducted to observe critical thinking disposition before and after a simulation, and that no grade would be connected with the experience. This subject presented herself as friendly to the characters but docile; she asked work-related questions like “How many admissions do you have in a month?” and appeared to avoid any interpersonal conflict. When confronted by the characters about interpersonal issues that exist in the organization, the subject make comments like “Oh, we’ll deal with that,” but returned to a discussion of work-related facts. The subject took notes during the entire meeting and seemed to avoid excessive eye contact with the characters. In the debriefing, the subject claimed that the simulation was a “good experience,” and that it “seemed like it was very realistic.”

Subject 2.3. This subject was confident and articulate. He presented himself to the characters in a professional fashion and attempted to conduct the meeting in a positive manner by focusing on accomplishments rather than failures of the organization. He gave

the characters positive feedback about all they had accomplished and expressed confidence that they would continue to be successful. In the post-simulation debriefing, Subject 2.3 expressed concern that he "didn't do a good job" because he had been unsuccessful at getting the discussion "to move away from negatives." When I explained that similar situations often occur in real world circumstances, the subject described the prospect of dealing with difficult employees in these situations as "scary."

Subject 2.4. Subject did not complete the post-test; therefore, the subject was disqualified from the study.

Day three. Five subjects were scheduled on the final day of the study, and four showed up for their appointments to participate in the research, and ultimately two were disqualified from the study. Once again, I faced issues related to time allotted for preparing and debriefing subjects for the simulation experience. Issues were similar to those addressed in previous days of the research – subjects needed more time than anticipated to read over the material, ask questions, complete the study instruments, and debrief after the simulation experience. Additionally, by day three, it was clear that logistics of the experiment needed further refinement in order to streamline the experience. For example, escorting of subjects from one area of the laboratory to another took time and personnel that were not factored into the initial plan. Additionally, subjects were scheduled to arrive at the time of their simulation appointment irrespective of the time necessary to prepare for the experience; thus, all simulations began later than anticipated.

Subject 3.1. This subject was timid. She reviewed the information packet and completed the pre-test without asking any questions. When confronted with the

simulation, she initially sat there, stared at the actors, and said nothing. Eventually, the actors began to ask questions like "Why are you here?" The subject responded by saying, "He told me to come in here." As the meeting progressed, the subject appeared to become more comfortable. She listened to problems outlined by the characters and said things like, "I'm not sure what I'll be able to do," and "Oh my god, that is terrible." In the post-simulation debriefing, the subject claimed that the experience was "great" because it made her realize that "she has to be more prepared."

Subject 3.2. This subject appeared nervous and told me that she "really wanted to participate in this experiment because simulation is a great thing." The subject reviewed the packet slowly and took extra time to complete the pre-test because she "didn't want to make a mistake." I explained the nature of the experiment and tried to reassure the subject that mistakes were not possible. Subject 3.2 seemed intimidated by the characters in the simulation. She often agreed with whatever they said and tried to offer assurances that issues would be resolved in "one way or another." In the post-simulation debriefing, the subject told me that she was "nervous" and believed that she should have been more "in control," that she would do better if she were allowed to participate in future simulations.

Subject 3.3. Subject was not a health administration major; therefore, the subject was disqualified from the study.

Subject 3.4. Subject did not complete the research instruments; therefore, the subject was disqualified from the study.

Control Group and Final Numbers

The research plan included a control group of subjects who would complete the *California Critical Thinking Disposition Inventory* without experiencing the simulation. I decided to complete the experimental phase of the study prior to recruiting for the control group; thereby, minimizing the possibility of confusing potential subjects. When the simulation experiments were complete, the remaining qualified health administration undergraduate students were sent a flyer (Appendix I) describing the experiment, along with a link to the critical thinking disposition instrument. There were 329 candidates who were qualified to participate in the research study. The experimental phase of the research yielded eight subjects who underwent the simulation experience and 12 who participated in the control group (Table 6).

Table 6

Study participant breakdown

*Total Qualified Candidates = 329	Participants	Percent
Experimental Group	8	2.43%
Control Group	12	3.64%
Total	20	6.07%

Discussion and Recommendations

I faced a number of unanticipated challenges in the implementation phase of the study. These challenges, although daunting at the time, generated learning that could be applied to future experiments.

Space issues and recruitment. Informal discussions with potential subjects before and after the simulation experiments indicate that some potential subjects were intimidated by the prospect of participating in a study that required interacting with live actors. Recruitment efforts for this research were limited to email flyers and word of mouth. For future studies, a formal recruitment plan should be established that includes in-person or online information sessions where students can learn about simulation and ask questions about the research process. Such a recruitment practice may increase participation in the study by enhancing the understanding and comfort level of potential subjects. The study plan did not allow for personal contact between the researcher and control group subjects. As with the experimental group, the addition of in-person or online information sessions may help to inform potential subjects about the research and, thereby, increase participation in the control group.

The simulation laboratory at Centerville University is busy and space is generally booked up to 12 months in advance. The compressed timeframe for this research made it impractical to schedule laboratory space so far in advance; therefore, the research was limited to dates that were not ideal for student subjects. It is recommended that, whenever possible, simulation laboratory space be scheduled as far in advance as possible to optimize recruitment efforts and enhance convenience for subjects.

Logistics of the experiment. The experiments were scheduled in 15-minute blocks with subjects arriving at the time they were to undergo the simulations. A number of logistical issues were uncovered in Cycle II that rendered the planned timetable impractical: greeting and instruction took longer than anticipated because subjects needed additional time to ask questions about the simulation and discuss expectations; the pre- and post-test instruments took longer to complete than anticipated; debriefing took longer than anticipated because subjects often wanted to discuss specific details of their simulation experience; and time for moving subjects from one place to another in the laboratory was not factored into the time schedule. Based on data collected in Cycle II, it is recommended that future simulation schedules be arranged in 105-minute blocks; thus, creating a more realistic timeframe for addressing each of the study components. Table 7 shows a revised simulation schedule block. Additionally, I found it difficult to keep up with the demands of managing the logistics of the experiment while collecting data and providing instruction and debriefing to subjects. In the future, it is recommended that research assistants be used to help manage logistics like escorting subjects and organizing paperwork.

Table 7

Revised Simulation Schedule Block for an Individual Research Subject

Begin	Activity	Time needed	End
9:00 AM	Greeting & Instruction	15 minutes	9:15 AM
9:15 AM	CCTDI Pre-Test	25 minutes	9:40 AM
9:45 AM	Simulation	15 minutes	10:00 AM
10:05 AM	CCTDI Post-Test & Post-Simulation Survey	25 minutes	10:30 AM
10:30 AM	Debriefing	15 minutes	10:45

Faculty participation. Initially, individual faculty members were loosely scheduled to observe any simulation experiment that was convenient. Since subjects did not always show up for scheduled appointments, it became difficult to match faculty availability with actual simulation proceedings. The issue was resolved when multiple faculty attended one of the simulation experiments. This worked well for both faculty and researcher since the group experience appeared to stimulate questions and open discussion regarding all aspects of the simulation; interested instructors were then invited to attend additional simulations. The efficacy of group versus individual observation of simulations by faculty should be explored in future research.

Actors. Throughout the experiment, actors provided valuable suggestions for how characters or situations might be tweaked to make the simulations more realistic. A constant informal dialog between researcher and actors helped to make small in-process

adjustments that ultimately improved the experience. For future experiments, it is recommended that formal conferences between researcher and actors be built into the study schedule; thereby, assuring adequate time for communication with actors.

Pilot study. In this research, plans for a pilot study were abandoned due to unforeseen issues related to laboratory space and recruitment of subjects. Cycle II findings support the recommendation for a pilot study from Cycle I. Through a pilot study, the researcher can improve efficiency by identifying and addressing potential logistical issues before they occur in the full study.

Conclusion

In Cycle II, eight simulation experiments were conducted over a three-day period, and qualitative and quantitative data were collected from student and faculty subjects via the established instruments. This phase of the research was successful in generating sufficient data to answer the research questions; additionally, the information collected herein forms the basis for collateral learning that might be valuable in helping to guide future experiments of this nature.

Chapter 6

Cycle III – Data Analysis

Introduction

In Cycle II, quantitative data were collected on critical thinking disposition of undergraduate students in the health administration program at Centerville University using the *California Critical Thinking Disposition Inventory*. A control group of subjects completed the CCTDI without undergoing simulation in order to help create a baseline upon which experimental data could be compared. I then used the instrument as a pre- and post-test for an experimental group of subjects who participated in simulation; these data were observed to detect any impact simulation might have had on critical thinking disposition.

In Cycle II, I also collected qualitative data on perceptions of the simulation experience through a subject-debriefing interview and questionnaire for subjects who participated in simulation. The qualitative data were used for the purpose of triangulation and to answer research questions regarding the perceptions of subjects and faculty of simulation. A questionnaire was used to collect data from faculty on their perceptions of the efficacy of simulation as a teaching and evaluative tool.

In Cycle III, I coded, collated, and analyzed study data in order to address the research questions. No identifiable data were maintained on experimental, control, or faculty subjects. Each subject was assigned a random number at the outset of the experiment. Numbers were used to organize data and distinguish subjects from each other during data analysis.

Quantitative Data

California Critical Thinking Disposition Inventory. Subjects for the study were recruited from approximately 329 students in the undergraduate health administration program at Centerville University; 21 students signed up for the study, and 12 showed up to participate in the simulation exercises. Twelve subjects underwent the simulation experiment; of those subjects, two were dropped for failing to complete the post-simulation questionnaire, and two were disqualified because their major was not health administration. Quantitative data were collected from the remaining eight qualified subjects who participated in the simulation experiment. The *California Critical Thinking Disposition Inventory* was used as a pre- and post-test instrument to examine critical thinking disposition before and after the simulation experience. Additionally, a control group was recruited from the pool of undergraduate health administration students who did not participate in the simulation experiment. Twelve student subjects signed up to participate in the control group.

> According to Insight Assessment (2015),
>
> Engaging problems and making decisions using critical thinking involves both skills and habits of mind. A strong critical thinker is one who is both disposed to think critically and has the skills to do so. (p. 12)

The *California Critical Thinking Disposition Inventory* is designed to measure seven attributes that are associated with the ideal critical thinker: Truth-seeking, analyticity, open-mindedness, systematicity, confidence in reasoning, inquisitiveness, and maturity in judgment. The CCTDI score array is described in detail in Figure 5.

"**Truth-seeking:** Truth-seeking is the habit of always desiring the best possible understanding of any given situation; it is following reasons and evidence where ever they may lead, even if they lead one to question cherished beliefs. Truth-seekers ask hard, sometimes even frightening questions; they do not ignore relevant details; they strive not to let bias or preconception color their search for knowledge and truth. The opposite of truth-seeking is bias which ignores good reasons and relevant evidence in order not to have to face difficult ideas."

"**Open-mindedness**: Open-mindedness is the tendency to allow others to voice views with which one may not agree. Open-minded people act with tolerance toward the opinions of others, knowing that often we all hold beliefs, which make sense only from our own perspectives. Open-mindedness, as used here, is important for harmony in a pluralistic and complex society where people approach issues from different religious, political, social, family, cultural, and personal backgrounds. The opposite of open-mindedness is intolerance."

"**Analyticity:** Analyticity is the tendency to be alert to what happens next. This is the habit of striving to anticipate both the good and the bad potential consequences or outcomes of situations, choices, proposals, and plans. The opposite of analyticity is being heedless of consequences, not attending to what happens next when one makes choices or accepts ideas uncritically."

"**Systematicity:** Systematicity is the tendency or habit of striving to approach problems in a disciplined, orderly, and systematic way. The habit of being disorganized is the opposite tendency. The person who is strong in systematicity may not know of a given approach, or may not be skilled at using a given strategy of problem-solving, but that person has the desire and tendency to try to approach questions and issues in an organized and orderly way."

"**Confidence is reasoning:** Confidence in reasoning is the habitual tendency to trust reflective thinking to solve problems and to make decisions. As with the other attributes measured here, confidence in reasoning applies to individuals and to groups. A family, team, office, community, or society can be trustful of reasoned judgment s the means of solving problems and reaching goals. The opposite habit is mistrust of reasoning, often manifested as aversion to the use of careful reason and reflection when making decisions or deciding what to believe or do."

"Inquisitiveness: Inquisitiveness is intellectual curiosity. It is the tendency to want to know things, even if they are not immediately or obviously useful at the moment. It is being curious and eager to acquire new knowledge and to learn the explanations for things even when the applications of that new learning are not immediately apparent. The opposite of inquisitiveness is indifference."

"**Maturity of judgment**: Maturity of judgment is the habit of seeing the complexity of issues and yet striving to make timely decisions. A person with maturity of judgment understands that multiple solutions may be acceptable while yet appreciating the need to reach closure at times even in the absence of complete knowledge. The opposite, cognitive immaturity, is imprudent, black-and-white thinking, failing to make timely decisions, stubbornly refusing to change when reasons and evidence would indicate one is mistake, or revising opinions willy-nilly without good

Figure 5. CCTDI score array. (Retrieved from Insight Assessment, 2015, p. 18)

According to Insight Assessment (2015), the CCTDI is a proprietary instrument that consists of 75 questions, and each of the seven attributes are measured in nine to 12 items on the test. Scores are interpreted according to the following scale: 50-60 (strong positive); 40-49 (positive); 30-39 (inconsistent/ambivalent); 20-29 (negative); 10-19 (strong negative). A strong positive result indicates that the attribute is strongly ingrained into the individual's approach to problem definition and solving; a positive score

indicates that the individual values the attribute; an inconsistent/ambivalent score indicates a varying commitment to the attribute being tested; a negative score demonstrates poor valuation or aversion; and a strongly negative score shows strong negativity or hostility toward the attribute. By evaluating each attribute, it becomes possible to identify limitations of individuals and groups that might negatively impact critical thinking; subsequently, educational programs can be designed to improve critical thinking by addressing these areas of weakness. Figure 6 shows a comparison of CCTDI scores between the experimental group pre- and post-test and the control group.

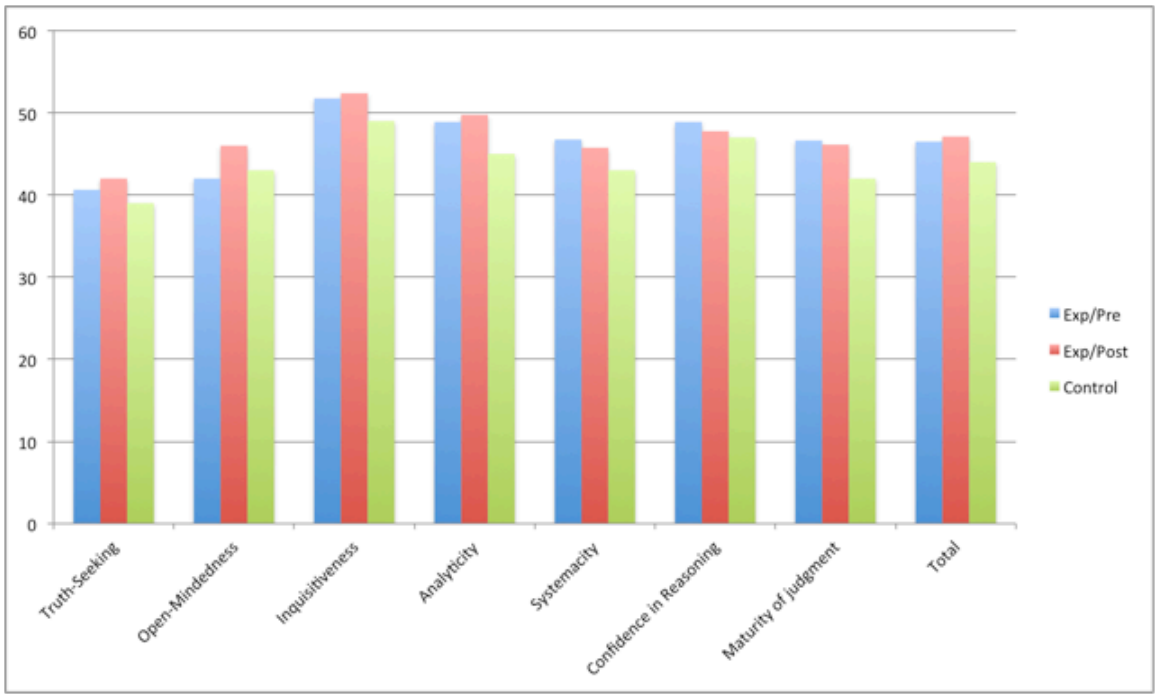

Figure 6. Comparison of CCTDI scores between experimental group pre- and post-test and control group.

For the experimental group, data collected from the CCTDI revealed an increase of 1.3% in overall post-test scores when compared to pre-test scores. Mean increases were observed for truth-seeking (3.38%), open-mindedness (9.52%), inquisitiveness (1.2%), and analyticity (1.07%); while decreases were noted in systematicy (-2.13%), confidence in reasoning (-2.3%), and maturity of judgment (-1.07%). The largest mean variance between pre- and post-test individual scores (9.5%) occurred in the open-mindedness category. Despite variances, individual pre- and post-test scores were in the "positive" range for truth-seeking, open-mindedness, analyticity, systematicy, confidence in reasoning, and maturity of judgment; while pre- and post-test scores for inquisitiveness were in the "strong positive" range (Tables 8 and 9).

Table 8

Experimental Group CCTDI Scores

Subject	Truth-Seeking			Open-mindedness			Inquisitiveness			Analyticity		
	Pre	Post	var	Pre	Post	var	Pre	Post	var	Pre	Post	var
16	39	49	10	46	53	7	58	60	2	55	56	1
29	53	52	-1	38	48	10	56	59	3	45	50	5
36	56	52	-4	43	48	5	55	55	0	60	60	0
45	41	38	-3	44	46	2	55	55	0	45	44	-1
61	29	33	4	41	44	3	43	42	-1	48	49	1
82	38	36	-2	46	47	1	53	52	-1	45	46	1
70	33	38	5	42	43	1	48	49	1	44	44	0
94	36	38	2	36	39	3	46	47	1	49	49	0
Mean	40.63	42.00	1.38	42.00	46.00	4.00	51.75	52.38	0.63	48.88	49.75	0.88
Median	38.50	38.00	0.50	42.50	46.50	3.00	54.00	53.50	0.50	46.50	49.00	0.50
Mode	#N/A	38.00	#N/A	46.00	48.00	3.00	55.00	55.00	0.00	45.00	44.00	1.00

Table 9

Experimental Group CCTDI Scores

Subject	Systemacity			Confidence in Reasoning			Maturity of Judgment			Total		
	Pre	Post	var	Pre	Post	var	Pre	Post	var	Pre	Post	var
16	53	51	-2	54	56	2	43	41	-2	348	366	18
29	55	55	0	59	53	-6	48	49	1	354	366	12
36	42	42	0	60	60	0	60	60	0	376	377	1
45	49	43	-6	47	38	-9	48	44	-4	329	308	-21
61	38	38	0	32	37	5	36	36	0	267	279	12
82	39	41	2	43	46	3	39	42	3	303	310	7
70	44	45	1	47	46	-1	48	49	1	306	314	8
94	54	51	-3	49	46	-3	51	48	-3	321	318	-3
Mean	46.75	45.75	-1.00	48.88	47.75	-1.13	46.63	46.13	-0.50	325.50	329.75	4.25
Median	46.50	44.00	0.00	48.00	46.00	-0.50	48.00	46.00	0.00	325.00	316.00	7.50
Mode	#N/A	51.00	0.00	47.00	46.00	#N/A	48.00	49.00	1.00	#N/A	366.00	12.00

The control group of subjects demonstrated positive scores in all areas except in the area of truth-seeking, where the group scored high in the inconsistent range (Table 10). The control group average overall score was 5.5% lower than the overall score of subjects in the experimental pre-test group, and 7% lower than the scores from the experimental post-test group. Individual control group scores were lower than experimental group scores in both the pre- and post- tests in all categories with the

exception of open-mindedness, where control group members scored slightly higher (4.6%) than those in the experimental pre-test, but lower than subjects in the experimental post-test (-4.5%). I expected the control group to demonstrate similar scores to subjects in the experimental pre-test group. No clear reason for this variance is apparent from these data.

Table 10

Control Group CCTDI Scores

Subject	Truth-Seeking	Open mindedness	Inquisitiveness	Analycity	Systemacity	Confidence in Reasoning	Maturity of Judgment	Total
1	38	41	51	37	44	51	38	300
2	43	48	56	49	45	51	50	342
3	32	38	48	44	39	40	43	284
4	32	43	40	41	37	40	28	261
5	39	40	56	45	47	56	49	332
6	38	49	47	43	51	47	41	316
7	28	40	50	47	37	48	40	290
8	48	44	56	49	45	50	47	339
9	44	44	47	42	41	40	44	302
10	38	36	43	42	41	40	40	280
11	44	48	54	51	52	53	44	346
12	41	45	44	47	39	42	45	303
Mean	39	43	49	45	43	47	42	308
Median	38.5	43.5	49	44.5	42.5	47.5	43.5	302.5
Mode	38	48	56	49	45	40	40	

CCTDI scores may indicate that undergraduate students in the health administration program at Centerville University are strong in the attributes measured by the test. In the experimental group, increased post-test scores in the areas of truth-seeking, open-mindedness, inquisitiveness, and analyticity may indicate positive impact on the subjects' willingness to abandon bias, increased alertness to consequences of personal behavior, improved tolerance toward differing opinions and heightened

intellectual curiosity. Decreased scores in systematicy, confidence in reasoning, and maturity of judgment may indicate that the simulation caused a disruption resulting in a less organized approach to problem-solving, along with hesitancy regarding problem-solving and analytical ability, as well as decreased confidence in personal ability to analyze complexity and make timely decisions. Further study is recommended to determine if a link exists between the simulation and decreasing scores in those areas. Due to limitations of the study, a correlation between simulation and higher critical thinking disposition in the experimental group cannot be assumed from the current research. Further study is recommended to explore the possibility of a link between simulation and critical thinking disposition, and to uncover other factors that may contribute to the variance in overall critical thinking disposition between the experimental and control groups.

Qualitative Data

The experiment. Each of the simulations ran in accordance with the established protocol – all subjects in the experimental group received an information packet before taking a critical thinking disposition pre-test, undergoing simulation, taking a critical thinking disposition post-test, participating in a debriefing and, finally, completing a questionnaire. The questionnaire consisted of five questions designed to uncover the participant's perceptions regarding the greatest challenge presented by the simulation, what was learned in the simulation, and what perceived impact the experience had on critical thinking. Additionally, the questionnaire asked subjects to describe the personality, motivation, and attitude of each simulation character, as well as anticipate future challenges that might be faced in dealing with that character. I observed each

simulation from the observation room in the simulation laboratory, and kept field notes to document data from observations and debriefings. Without exception, subjects immediately reported positive feelings post-simulation. As the experiment progressed, themes emerged related to self-awareness, perceptions of the experience, and leadership.

Self-awareness. I believe that a measure of self-awareness can be seen in each of the identified themes as subjects began to recognize how their own actions and reactions effected communication, group dynamics, and leadership effectiveness. The perception and leadership sections address self-awareness as it pertains to the subject's effect on a group; in this section, I address self-awareness as it pertains to the group's effect on the subject.

The simulations appeared to have provided subjects with concrete experiences from which they could gain perspective on their own learning needs; as well as experiences that promoted critical thinking, specifically, the ability to recognize relationships, make inferences, and deduce conclusions (Pascarella & Terezinni, 1991). For example, Subject 1.2 recognized that the beliefs of others might conflict with his own worldview, and Subject 2.1 was confronted with a realistic situation where he learned the outcome might be less than ideal despite the best effort of a leader.

The quantitative data demonstrate that the experimental group's CCTDI post-test scores were higher than pre-test scores in the areas of analyticity, and open-mindedness (Insight Assessment, 2015). Supporting qualitative data reveal that subjects were alert to the potential consequences of their actions (analyticity), and began to recognize value in the opinions of others (open-mindedness). After the simulation experience, subjects seemed to have gained perspective on how different actions on their parts might have

altered the outcome of the simulation. Subject 1.2 learned that he might need to alter his communication style in order to facilitate an effective group process. Subjects 2.3 and 3.1 learned the importance of active listening and asking appropriate questions in order to facilitate open communication.

Perceptions of the experience. Subjects approached the simulation with varying levels of work experience, managerial ability, and academic accomplishment. In the initial moments of the simulations, all subjects demonstrated signs of anxiety, some common reactions included visually scanning the room, body fidgeting, speaking softly, or appearing at a loss for words. In all cases, those outward symptoms faded as subjects became immersed in the scenario. Within moments of beginning the simulations, all subjects were called upon to respond to questions, comments, and concerns of the actors. These challenges seemed to provide a focal point for attention and an imperative toward action. In each subject case, I observed a progression from inaction to some level of active participation in the simulation.

Perceptions of the experience were addressed in the post-simulation questionnaire and in the post-simulation interview that I conducted with each subject. Subjects' perceptions of the simulation experience demonstrate recognition of complexity inherent in the given situation, as well as the importance of organized thinking, and the realization that initial impressions are sometimes inaccurate or incomplete. The simulation provided subjects with an opportunity to examine a situation from multiple perspectives, consider potential choices, and anticipate the consequences of those choices. I believe that these factors may have contributed to the increase in analyticity (Insight Assessment, 2015) noted in the CCTDI post-test scores. In fact, the qualitative and quantitative data

demonstrate that the simulation may have challenged held beliefs about how situations should be addressed, causing a disruption in perceived understanding, followed by the realization that new thought models need to be created (Smith, 1996).

Feedback in this area focused on the need for simulation training despite initial apprehension. Typical comments included, "I was nervous at first but soon forgot about it not being real;" "It was a totally new experience. Scary but fun;" "It made me realize that we need this kind of training." Subjects believed that the simulation environment was "realistic," and that the experience demonstrated the need for competent, articulate managers who are prepared to cope with the unexpected. Typical comments included, "I needed my ducks in a row. It shows how much you need to be prepared [for meetings with subordinates];" "It makes you realize how many different things can happen in the real world;" "It was different than I thought it would be;" "You are on the spot. You have to think fast and know what to say." Subjects identified initial challenges related to group process rather than individual characters; they recognized "conflict," "aggression," "negativity," and "anger" among the group members.

Leadership. Subjects recognized a need to understand and manage the interpersonal dynamic at play in the simulation and some subjects believed that focusing on group communication was an important first step, while others thought that calming staff or establishing a collective goal was the primary challenge. In general, subjects initially believed that the primary focus of the simulation should be to "try to get a message across to a group of people that do not like the way the organization is being managed," "get all present to agree on what needs to be done," "try to reach a talking point that doesn't re-ignite feelings and emotions."

The simulations appeared to spark a certain amount of leadership uncertainty in subjects who frequently felt frustrated or insecure about their effectiveness in the simulation. The quantitative data support this observation by demonstrating decreased post-test CCTDI scores in systemacity, confidence in reasoning, and maturity of judgment, indicating that the simulation may have disrupted previously held beliefs about problem solving and caused personal confidence and judgment to be called into question.

Many subjects expressed frustration because the actors added an unexpected dimension to the experience by sometimes persisting with "negative" or "confrontational" behavior despite how the subject conducted the meeting. Typical comments included, "It would have been much easier if the actors were cooperative," or "I was frustrated because the actors wouldn't let me do my job." The simulations seemed to illustrate the concept that a perfect solution may not exist for every problem, and group consensus may not always be possible, despite best efforts of a manager to broker agreement. Subjects observed specific behaviors like "hostility" and "aggression" and, by communicating with characters, were able to diagnose such conditions as "distrust," "disillusionment," and "burnout." This information was then used to identify management challenges related to increasing motivation and trust, diffusing negativity, and partnering with employers to help advance organizational goals. Subject 1.3 recognized that she needed to become a more assertive leader, Subjects 2.1 and 2.2 realized that they needed to learn different leadership strategies in order to handle a complex situation, and Subject 3.2 realized that she needed to be in better control of meetings.

Subjects learned that group processes are not easily controlled, and that managers must act and react in accordance with cues from the group members. In general, subjects believed that the simulation helped them to think critically because they were required to quickly form and implement plans of action; they recognized the need for a combination of leadership skills such as organization, proper use of legitimate authority, and ability to draw from various sources of learning to cope with the situation at hand. Subjects realized that issues presented in the simulation were complex and required multiple steps to reach a resolution; they recognized that personal qualities such as sensitivity to the environment, and observation skills are important factors when evaluating complex management situations.

Faculty. Faculty observers of the simulation experiment were required to complete a questionnaire designed to collect information regarding their perceptions of the strengths and weakness of simulation, as well as the perceived value of simulation as a training and evaluative tool. Results indicate that instructors believe the strength of simulation lies in its ability to create an environment where abstract concepts may be brought to life, and where students may be challenged to apply various learning to realistic situations. Faculty comments centered on the value of simulation in management, leadership, and ethics scenarios where students could cope with the urgency of real time situation and, therein, be required to deal with the consequences of choices and decisions. One instructor summed up the general feeling from faculty: “The experience provides multiple sources of reflection and presents an important opportunity to go beyond conceptual knowledge so students can understand the challenges of application.” Although no negative comments were recorded from faculty, two

responders did stipulate that simulation should be employed as a "practical component" to more traditional methods of instruction. Faculty identified "student anxiety" and "time investment" for both faculty and students as potential weaknesses of simulation; nevertheless, they believed that the experience enhanced conceptual and technical competencies related to management and organizational behavior, and enhanced self-awareness and problem solving skills. No instructors related a sense of personal discomfort with the simulation process; however, I suspect that a focus on anxiety and time management may indicate some level of trepidation on the part of faculty to embrace an unfamiliar teaching modality.

Overall, faculty comments appear to indicate that simulation could be used as a practical means to achieve objectives of the undergraduate health administration program, including enhancement of critical thinking skills, improvement of learning, integration of conceptual and technical competencies and evaluation of program outcomes (Centerville University, 2008).

Due to scheduling issues, multiple instructors attended the same simulation exercises; this unplanned occurrence ignited a group process wherein faculty were able to discuss the simulation with me and among themselves. These discussions built excitement about the simulation technique and garnered support for its use in the health administration program. While this study appears to demonstrate faculty engagement in simulation learning, the findings are limited by the scope of the research and the possible impact of the group dynamic on the final outcome. The issue of faculty engagement in simulation learning techniques presents an opportunity for further study, and should be explored in more detail in future research.

Conceptual Framework

I used Kolb's (1984) model of experiential learning as a framework to demonstrate how simulation creates experiential learning, which in turn, stimulates critical thinking. I approached the work believing that aspects of Humanism, Cognitive Development, Behaviorism, Social Psychology, and Social Learning Theory were at play in the process of transforming experience into learning.

In humanism, individuals must take responsibility for their own actions; personal fulfillment is achieved through the development of self-confidence and a greater appreciation for the complexities of real world situations (Mikkelson et al., 2007; Ravert, 2002), and cognitive learning results from experimentation with mental models and the actions that result from ideas and beliefs (Smith, 1996). Subject 1.2 realized, perhaps for the first time, that his personal worldview might be a limiting factor in his ability to communicate with certain individuals. The simulation prompted the subject to take responsibility for his actions, and recognize that he might need to develop different strategies in order to establish effective relationships with some people. In behaviorism, change is promoted over time through reinforcement of desirable actions; it espouses the importance of cooperation over competition (Ely & Plomp, 1996). The simulations provided subjects with an opportunity to practice skills learned in the classroom; however, it did not provide an external locus of control to identify or reinforce desirable behaviors. Nevertheless, subjects seemed able to self-identify behaviors that seemed most desirable and appropriate. For example, Subject 2.3 recognized that his initial attitude toward the characters was a positive attribute and Subject 3.1 noted that her failure to be prepared for the meeting resulted in an overall negative outcome. Social psychology is

concerned with the presence of other people and the interconnection of individuals with their environment (Burns, 2004). The entire study relied on group dynamics where subjects were required to cope with known and unknown factors in order to interact with a group of actors in a complex social situation. Social learning theory postulates that learning occurs through observation or direct instruction that results in a decision about a particular behavior (Social Learning Theory, n.d.). The simulations occurred in a social environment where the subjects were afforded the opportunity to observe and interact. Data collected from the debriefing interviews demonstrate that subjects had begun to reflect on the meeting dynamic and conceptualize how their own behaviors set the tone for the interaction.

In the end, I believe that this research demonstrates how simulation can provide a concrete experience, which launches Kolb's (1984) model of experiential learning, in which are embedded aspects of Humanism, Cognitive Development, Behaviorism, Social Psychology, and Social Learning Theory. In turn, experiential learning becomes the basis for improved critical thinking (Figure 7).

I believe that this new model demonstrates how the various theories are inseparable from the original model of experiential learning, and how the theories can be used as a lens to clarify or focus the intent of the simulation experience. This focus of intent may modify the simulation experience and, thereby, change the experiential learning and the subsequent effect on critical thinking. For example, my simulation was high on environmental complexity (Social Psychology), but left little room for individual creativity (Humanism) or experimentation (Cognitive Learning). Perhaps the outcome measure of critical thinking disposition may have been altered if the simulation was

designed to permit subjects to use personal creativity or experiment with a range of possible solutions. Along the same lines, I begin to wonder if instructors predispose a level of critical thinking by exposing students to simulation experiences that lack diversity of focus. I believe that these questions should be addressed in future research on the link between simulation, experiential learning, learning theories, and critical thinking.

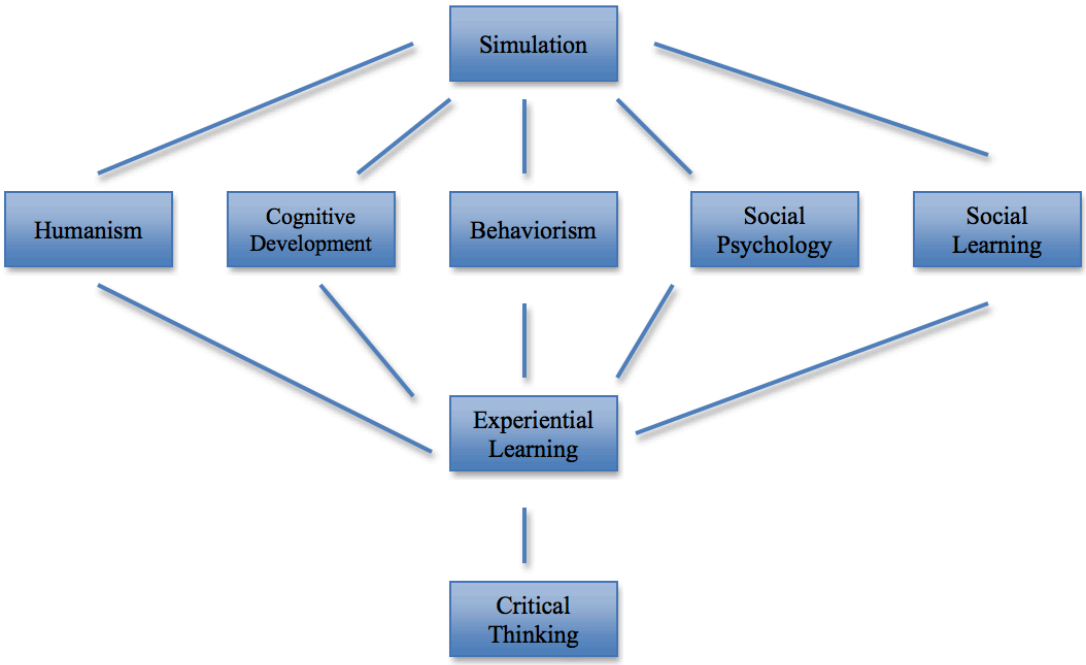

Figure 7. Simulation/experiential learning model.

Leadership Style

Leadership style was not a factor in this research study; however, upon analysis of qualitative data gleaned from observing the simulations, I noticed that subjects appeared to use three distinct leadership styles. Hersey's (1984) situational leadership model, as adapted by Bolman & Deal (2008) (p. 349), was used to describe how subjects appeared to approach the leadership challenges presented in the simulation (Figure 8).

High Relationship, Low Task: **Leadership Through Supporting** Use when followers are "able" but "unwilling" or "insecure"	*High Relationship, High Task:* **Leadership Through Coaching** Use when followers are "unable" but "willing" or "motivated"
Low Relationship, Low Task: **Leadership Through Delegation** Use when followers are "able" and "willing" or "motivated"	*Low Relationship, High Task:* **Leadership Through Directing** Use when followers are "unable" and "unwilling" or "insecure"

Figure 8. Situational leadership model. (Bolman & Deal, 2008)

While each actor approached the experiment with an established character backstory, the actual interactions within the simulations were unscripted and heavily dependent on the leadership of the student subject. Actors were advised to improvise using the character backstory as a basis for their reactions. The results were simulations that, despite a certain amount of prefabrication, still had the potential to move in unexpected directions. Subjects tended to approach the simulations in one of three ways that each yielded very different results.

Leadership through supporting (high relationship, low task). Subjects who used this approach presented themselves as leaders who intended to initiate fundamental change in the organization's culture that would be reflected in practice and ultimately transform the organization. These students tended to address the feelings of the characters, as well as the organizational philosophy and mission. They asked questions like, "What makes you want to stay here," and "What do you like most about your job?" Additionally, subjects in this group tended to try and develop emotional ties to the characters by projecting a sympathetic attitude and espousing a vision wherein change

would occur through the efforts of all stakeholders working shoulder to shoulder. Based on organizational history, the characters were wary of a baseless transformative approach; therefore, they tended to question these subjects about a concrete plan to support the vision. Characters dismissed these subjects as unrealistic and unprepared if they could not provide tangible suggestions for how to implement their ideals.

Leadership through directing (low relationship, high task). Subjects with this approach focused on the work of the organization and its outcome; they often asked proactive business questions like, "How many admissions do you have in a month," "What is the bottom line," and "How often do managers meet to discuss the issues?" These subjects tended to avoid emotionally charged issues, and they often discouraged discussion related to feelings or interpersonal problems. The characters viewed transaction-focused subjects as moneygrubbers who would degrade the quality of service and ultimately rob the organization of its resources. These subjects were often confronted about their views regarding organizational mission and personal integrity of the new administration.

Leadership through delegation (low relationship, low task). Subjects in this category did not directly take control of the simulation; instead, they permitted the characters to set the tone of the meeting. One subject kept silent after introducing herself and waited for the characters to begin the discussion. When asked about her plans for the future, the subject told the characters that she did not consider herself in charge and, in fact, she believed that they should be responsible for determining the direction of the organization. Another subject in this category told the characters that she was "baffled" and wanted their guidance to determine how to proceed with the meeting. The characters

responded most strongly to subjects in this category, directly questioning why the subjects accepted a management position, and reminding them of their responsibility to perform the leadership duties for which they were paid.

The leadership styles used by subjects may emanate from preconceived notions regarding the "willingness," "security," or "motivation" of the characters, as well as the subjects' competence, maturity, readiness, and commitment (Bolman & Deal, 2008). While this study does not address these issues, or the effectiveness of the leadership styles in use by the subjects, it does suggest areas of consideration for future research.

For me, these observations raise important questions related to whether or not a correlation exists between critical thinking and leadership styles in use. In particular, I wonder if teaching philosophy and practice influences students to adopt particular leadership styles, and whether or not those leadership styles predispose critical thinking capability. These questions present an opportunity where simulation may be applied in future research to examine the correlation between educational practice, leadership styles, and critical thinking.

Conclusion

Quantitative data were collected using the *California Critical Thinking Disposition Inventory*; the instrument was used as a pre- and post-test for an experimental group of subjects who underwent simulation, and for a control group of subjects who did not experience simulation. Data indicate that subjects, as a whole, are strong in the attributes measured by the CCTDI. Scores demonstrate that the experimental group scored higher overall than did the control group. Results for the experimental group show some variations between the pre- and post-test scores. Due to the limitations of the study,

a correlation between simulation and critical thinking disposition cannot be inferred from the quantitative data. Additional research is recommended to determine if a measurable correlation exists.

Qualitative data gleaned from observations interviews, and questionnaires do appear to support quantitative data findings. The results of the *California Critical Thinking Disposition Inventory* demonstrates a tendency toward attributes that are strongly associated with critical thinking, such as truth seeking, open-mindedness, inquisitiveness, and analyticity. Likewise, qualitative findings show that simulation challenged subjects in areas germane to critical thinking, such as leadership and interpersonal communication; the experience challenged subjects to evaluate situations, make inferences, deduce conclusions and, ultimately, act on those conclusions (Pascarella & Terezinni, 1991). Subject comments focused on perceptions of the experience, self-awareness, and leadership. Subjects believed that the simulation experience helped them recognize that leadership is dynamic and outcomes are often unpredictable; they exited the experience with insights regarding personal behavior and learning needs.

Quantitative and qualitative data gleaned from the study do appear to demonstrate that simulation using standardized participants has the potential to launch the first three stages of Kolb's (1984) model of experiential learning, and experiential learning may enhance critical thinking skills (Clapper, 2009; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010). Data suggest that simulation may provide experiential learning that stimulates reflection and formation of abstract conceptualizations in accordance with Kolb's (1984) model. Subjects recognized that learning is a process that must be grounded in experience with both people and organizations, that conflict must be

addressed in a holistic fashion that takes into consideration various modes of adaptation, and that learning is the result of social and personal knowledge. The simulation appears to have launched the first three stages of Kolb's (1984) experiential learning model: Stage 1 – the simulation provided a concrete experience upon which to base learning; Stage 2 – qualitative data collected through the study instruments demonstrate that subjects reflected on the simulation, evidenced by comments regarding personal performance or learning gained through the experience; and Stage 3 – abstract conceptualization was evidenced by subjects' ability to perceive relationships between their own actions and outcomes of the simulation. Due to the limited nature of this study, further research is recommended to explore the correlation between simulation and Kolb's model of experiential learning.

Faculty observers of the simulation experiments believed that simulation provides a realistic environment wherein abstract concepts can be observed and tested by students. They recognized that simulation teaching techniques can be useful for management, leadership and ethics instruction, and that simulation can be useful as a tool to evaluate technical and conceptual competencies learned in the undergraduate health administration program at Centerville University.

Chapter 7

Summary of Findings

Discussion

In this final chapter, I provide a summary of the components of this research, including simulation, critical thinking, experiential learning, and capstone as an educational tool. Further, I review the methodology used in the study, and provide a summary of findings, along with specific recommendations, limitations, and implications for future research.

Simulation. Simulation is an educational technique wherein students learn by participating in a fabricated event designed to guide experience through realistic replication of real life in a safe and controlled environment (Como et al., 2009; Gaba, 2007). The nearly real experience provided by simulation allows students to learn by doing; it promotes visualization, which is a key component of experiential learning (Campbell t al., 2009; Wang, 2011). In general, students react positively to a simulation; tangible benefits to students include increased self-confidence and a greater appreciation of the complexities of real world events (Bearnson & Wilker, 2005; Mikkelson et al., 2007; Ravert, 2002). For faculty, simulation is regarded as a means to evaluate teaching effectiveness and student competence (Becker et al., 2006).

Various types of simulation techniques – including games, and computer spreadsheet models – have been embraced by business educators for their ability to help students develop a firmer grasp of theories and concepts taught through traditional classroom instruction (Faria & Wellington, 2004; Xu & Yang, 2010, Zapalaska & Brozik, 2001). Simulation in health administration education is less widely used. In a study

conducted by Royal (2011), simulation was employed to enhance learning and communication skills of health administration students. The study concluded that participants found simulation to be a valuable learning experience. In medicine and nursing, simulation is viewed as beneficial in helping students to build core competencies, cope with unpredictability, and manage legal and ethical constraints inherent in healthcare practice (Becker et al., 2006; Galloway, 2009). The next step in the evolution of simulation was the use of "standardized patients," actors who are trained to portray patients in realistic scenarios designed to mimic real-life clinical situations. Standardized patients provide students with the opportunity to practice clinical and communication skills in a safe environment, apply leadership principles, and participate in interdisciplinary teamwork (Barnett et al., 2010; Brender et al., 2005; Sharpnack et al., 2011).

Critical thinking. Critical thinking is an abstract conceptual concept (Weis & Guyton-Simmons, 1998) that typically includes the ability to "identify central issues and assumptions in an argument, recognize important relationships, make correct inferences from data, deduce conclusions from information or data provided, interpret whether conclusions are warranted on the basis of data given, and evaluate evidence or authority" (Pascarella & Terezini, 1991, p. 118). The ability of simulation to directly effect critical thinking continues to be explored. Simulation provides students with an opportunity to practice skills, and improvement of critical thinking may be related to the amount of repetition or practice of a skill (Mulnix, 2012); however, the ability of simulation to improve higher-order thinking and problem-solving skills typically associated with critical thinking requires further study (Kaakinen & Arwood, 2009).

In this experiment, quantitative data suggest that simulation may positively impact some of the factors that are associated with critical thinking. Subjects who experienced simulation scored slightly higher on post-test over pre-test in the areas of truth-seeking, open-mindedness, inquisitiveness, and analyticity. Additionally, qualitative findings demonstrate that simulation created an environment where critical thinking was stimulated in a complex environment where subjects were required to identify and diagnose leadership issues, choose courses of action, and cope with the outcome of choices.

Experiential learning. According to Coker (2010), "experiential learning involves hands-on experience in a practical setting to test information learned in didactic coursework in an actual practice environment" (p. 281). Various studies indicate that experiential learning may enhance critical thinking skills (Clapper, 2009; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010). Simulation may provide experiential learning that, in turn, may enhance critical thinking skills. Kolb (1984) presents a four-stage model of experiential learning: Stage 1 – concrete experience, Stage 2 – observation and reflection; Stage 3 – formation of abstract concepts; and Stage 4 – testing in new situations.

This study suggests that simulation creates experiential learning that launches Kolb's model. Qualitative data from this research demonstrate that subjects found the simulation to be a multifaceted and powerful experience that challenged them to observe, analyze, and reflect upon the external situation at hand, as well as their own learning needs, interpersonal skills, and leadership style. Evidence showed that subjects drew upon this information and began to perceive new personal leadership paradigms.

Capstone. The term "capstone" is frequently used to describe a course or final experience used to provide students with an opportunity to consolidate and apply learning acquired through a degree program. Capstones have the potential to embed skills such as critical thinking into an undergraduate business curriculum (Acker & Bailey, 2011). Faculty in the health administration program at Centerville University seek opportunities to integrate foundation studies as well as conceptual and technical competencies, and to find efficacious means to evaluate program outcomes (Centerville University, 2008). Simulation using standardized patients has the potential to be an effective capstone experience for students at Centerville University, because of its potential to effect critical thinking through experiential learning, provide students with the opportunity to hone communication skills, apply leadership principles, and participate in interdisciplinary teamwork (Clapper, 2009; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010).

Answers to Research Questions

The research was conducted using applied action research methodology. I designed a study wherein experimental and control groups of subjects were studied to observe the impact of a simulation experience on critical thinking disposition. I also observed the perceptions of faculty regarding the efficacy of simulation as a training and evaluative tool for the undergraduate program at Centerville University. The goals of the study were achieved through a triangulation approach to data collection using qualitative and quantitative research instruments. The study yielded sufficient data to address the research questions:

How does simulation through the use of standardized participants impact the critical thinking skills of undergraduate health administration students at Centerville University?

Subjects approached the simulation with varying degrees of confidence, enthusiasm, excitement, and trepidation. The ensuing experience was driven almost entirely by the subject's ability to conduct a business meeting and establish rapport with the characters. From the observer's standpoint, the meetings met with varying levels of success – some subjects were able to proactively manage the situations at hand while others appeared to withdraw or allow the characters to take control of the meeting. Regardless of the observer's perspective of success or failure, the subjects invariably reported positive impressions of the experience. In post simulation debriefing interviews, subjects appeared acutely self-aware and capable of evaluating their own performance. Many of the participants emerged from the simulation with insights regarding their own learning needs. Such results appear to indicate that subjects recognized that learning is the result of social and personal knowledge that is grounded in experience. The simulations appear to have launched the first three stages of Kolb's (1984) model of experiential learning by providing the opportunity for concrete experience, personal reflection, and abstract conceptualization. Qualitative data from the *California Critical Thinking Disposition Inventory* demonstrate increases in some of the qualities associated with critical thinking disposition after the simulation experience. Although this study shows promising results, further research is recommended to demonstrate that simulation through the use of standardized participants is useful in creating experiential learning, which in turn, improves critical thinking.

What are students' perceptions of the impact of a simulation experience on their own critical thinking skills?

Students perceived that the simulation had a positive impact on their critical thinking skills; it allowed them to participate in a realistic experience where they were required to view, interpret, and cope with a group dynamic. The result was a realization that leadership is a complex process of assessment, decision-making, re-assessment, and adjustment. In general, subjects emerged from the experiment with a clearer understanding of how various learning must be quickly accessed and assimilated in order to create leadership strategies – a process that appears to reflect Kolb's (1984) model of experiential learning.

What are faculty perceptions of the efficacy of simulation as a training tool for undergraduate students in the health administration program at Centerville University?

Faculty at Centerville University believed that simulation provides a controlled environment where abstract concepts may be brought to life in realistic situations. In particular, faculty recognized that simulation would be ideal for training students in leadership and ethics courses where diverse perspectives are required in order to address complex situations. In general, faculty believed that simulation would be efficacious in the training of undergraduate students in the health administration program at Centerville University, particularly when employed in conjunction with classroom instruction and written assignments.

How can simulation be effectively used to evaluate conceptual and technical competencies of students at the conclusion of their undergraduate health administration program at Centerville University?

Faculty believed that simulation could be used in a program capstone as an adjunct to the classroom experience; in particular, as a means to measure didactic learning, or as a practical component to demonstrate the complexity of various leadership or ethical issues. Instructors believed that simulation would provide a method for evaluating competency in basic communication and problem solving skills, managerial ability, and organizational behavior, as well as means for observing soft skills like "self-awareness," and "emotional intelligence."

Recommendations for Future Health Administration Simulations

Planning. The planning phase was fraught with unanticipated challenges related to scheduling of laboratory space, recruiting subjects, and obtaining funding for the study. In order to help mitigate these unexpected issues, a pilot study is recommended, along with sufficient lead-time to permit thorough exploration of all logistical details prior to implementation of the full study.

Recruitment. For this study, subjects were recruited through an emailed flyer and word of mouth. I found that potential subjects had more questions than I anticipated regarding the simulation, which may indicate that some more instruction is required to help potential subjects understand the conceptual and practical underpinnings of simulation. For future studies, I recommend a formal recruitment plan that includes in-person and online information sessions where subjects can learn about the research first-hand from the researcher and pose questions in an open forum.

Laboratory space. If possible, simulation laboratory space should be booked at least 12 months in advance to allow maximum flexibility for planning the simulation, and recruitment and scheduling of subjects and faculty.

Logistics. Simulation blocks should be arranged so that there is adequate time for subjects to complete all aspects of the experiment without undue hurry. Flexibility is necessary in order to address unanticipated delays. It often took longer than I expected to greet and instruct subjects, or to escort subjects from place to place in the laboratory; additionally, some subjects needed additional time to complete the pre- and post-test surveys. The use of research assistants should be considered in order to help manage the logistics of the experiment.

Faculty. Due to scheduling issues, it was difficult to get instructors to make individual appointments to observe a simulation experiment. I recommend offering the possibility of a group experience where multiple faculty members may observe a single simulation. The group experience allows for efficiency in orienting instructors to the simulation; additionally, group engagement helped to generate questions and enhance discussion about the research.

Actors. Throughout the experiment, I maintained a constant informal dialog with the actors in order to discuss situations and exchange feedback. In addition to this informal exchange, I recommend that future studies include time for formal debriefing interviews with the actors at the end of each day of the experiment. Such meetings will allow for a more thorough exchange between the researcher and actors, and make it easier for the researcher to collect and document qualitative data from the actors.

Leadership Reflection

I always viewed myself as a transactional/structural leader (Burns, 2003). Most of my professional background has been in business or healthcare where organizations are hierarchal and less organic in nature. My experience taught me that the ability to establish

structure is an important leadership quality, and I came to believe that leaders must design organizational frameworks that facilitate transactions, enhance communication, and create stability within an organization. Structure goes hand in hand with transaction, and transactional skills are fundamental to the procurement of needed resources, and essential for the optimization of their use. Consequently, I honed my transactional skills and came to rely upon structure as a means to ground and manage an organization.

Despite a reliance on transactions and structure to achieve organizational goals, I believe that people are best influenced through charismatic leadership (Burns, 2003). In my opinion, the best leaders are those who can persuade followers without using position power or formal authority. I found that position power, while effective for compelling compliance, does not promote a sense of ownership in followers, enhance loyalty, or improve outcomes (Levi, 2007). As a firm believer in modeling behavior, I try to remain cognizant of my image and actions. I promote shared responsibility between leaders and followers, and I encourage followers to become full partners in the work of the organization. I always believed that my transactional/structural and charismatic styles blended well and were well balanced.

In my opinion, transformation is unavoidable and, thus, should be managed and encouraged by leaders; however, I believe that transformation by itself is an empty concept. I see transformation as a process that evolves slowly over time. I think that many leaders aspire to a transformational style, but fail to understand that transformational leadership cannot exist independent of other styles. It must coexist with more practical approaches, and it must be ever present to initiate and enhance the quality and timeliness of change. Although my primary leadership styles are

transactional/structural and charismatic, I try to maintain a transformational mindset in all things (Burns, 2003). As a responsible leader, I believe it is my job to carry the organization into the future by promoting change and constantly finding ways to redesign the status quo.

At the outset of Cycle I, I viewed the entire project within a structural paradigm. It seemed easy enough to put each phase of the study into a neat well-ordered box that could be observed, controlled and evaluated. Even better, it looked like each specific step could be reduced to a series of transactions that could easily be planned, carried out, and measured. In my orderly mind, I imagined a comfortable structure within which multiple transactions would run flawlessly to produce data that could then be transferred to the written page – end of dissertation! Without a doubt, my research would be transformational since it addressed areas of need identified by practitioners in the field, and since it would call upon subjects to delve deeply into the recesses of their souls and produce insight about their own learning needs. I knew that some measure of charisma would be needed on my part to recruit subjects and persuade various stakeholders of the value of the research.

The initial planning in Cycle I went well. I had developed a clear structure for the study and each prospective transaction had been well considered. When I began the first steps of implementation, I expected that the project would move forward like a well-oiled machine. It did not. From the beginning, nothing worked out as planned. There were problems getting simulation lab space, problems recruiting subjects, problems securing the necessary study instrument, and problems with IRB. There were cracks in my structural foundation, so I solved the problem with more and better structure. I shored up

the plan for Cycle II by creating a more precise plan for moving forward, I made lists and notes, and I met with various stakeholders to make sure they were prepared to play their parts in the study. I was ready for Cycle II.

Cycle II started going wrong even before dawn on the first day of implementation. It snowed. To make matters worse, there were logistical problems in the lab that I did not foresee and subjects did not show up for scheduled (and confirmed) appointments. I had miscalculated time needed to run the experiments comfortably and, as a result, I found myself dealing with interpersonal issues related to subjects, actors, and faculty. Unfortunately, the problems with structure could not be resolved with further structure – what was needed was good old-fashioned charisma. At this point in Cycle II, I began to realize that charismatic leadership needed to become my predominant style in this situation, and I found it exhausting.

I anticipated that Cycle III would be the easiest; after all, analysis is about structure and I felt comfortable describing the various issues, transactions, and results gleaned from the study. All was well until my dissertation advisor began to ask for more detail in my writing. I provided additional detail and yet he still asked for more…more…more. I began to feel frustrated and empty until I realized that he was asking for more than just structural detail, he was asking for something organic where I put more of 'myself' into the analysis. He was asking me to blend myself into the research and the data and the findings in order to create something truly unique. I cannot say that this realization made the task any easier. I can say that it was one of the biggest challenges of my life.

So here I sit asking myself why a research study was one of the biggest challenges of my life. After all, I am a smart person and a good writer; I certainly have the academic and technical skills necessary to produce the work. In the end, I believe that the answer lies in who I am as a person and a leader. I started out seeing myself as a structural/transactional leader who easily blends a charismatic style in order to get the job done. I now recognize that I am a little too structural and far less charismatic than I thought. I realize that I have to work hard at the people relationships, and I am most comfortable with those relationships when they are well structured and easily defined. I recognize that I have a level of discomfort with exposing too much of my inner self.

I still believe that a leader must have a transformational mindset and the skills necessary to drive initiatives forward. I approached this study with a transformational mindset. I expected the research to be transformational for the subjects, and I believe it was. Perhaps because of naiveté or hubris, I never really considered that this research might transform me, but in the end it did. I still see myself as a structural/transactional and charismatic leader, but I now recognize that those traits do not exist in equal parts, and that I have to work harder at balancing my approach. I learned that surety and complacency – even about my own leadership style – are not good things, and that I must move out of my comfort zone in order to continue to grow as a leader.

Implications for Future Research

This research demonstrates that simulation provides experiential learning which, in turn, enhances critical thinking (Clapper, 2009; Coker, 2010; Hamilton & Klebba, 2011; Kolb, 1984; Lisko & O'Dell, 2010). Quantitative and qualitative data collected in this research appear to indicate that the simulation experience launched Kolb's (1984)

model of experiential learning, in which students have a concrete experience, observe, and reflect upon the experience, and begin to form abstract conceptions regarding the experience. Due to the limitations of this study, additional research is necessary to further examine the correlation between simulation and critical thinking disposition, as well as a possible link between simulation and other educational theories, to determine if the findings are transferable, and to further explore the relationship between critical thinking disposition and leadership styles in use.

Limitations

The study is limited by the size of the sample. Subjects may not be representative of the student population at Centerville University, since participation was voluntary and specific demographic data were not collected. Results of this research may be impacted by factors such as age, cultural background, and academic accomplishments of the participants. The study may also be impacted by the willingness of subjects to answer questions honestly, or by other factors such as anxiety or comfort with the simulation process. Faculty data may be impacted by the individual instructor's willingness to answer questions honestly, preconceived ideas about simulation, or personal relationship with me. I attempted to address the issue of reliability by using a triangulation approach to data collection and interpretation; however, sample size limitations may impact the reliability of data inferences. Publishers of the CCTDI addressed validity of the pre- and post-test instrument by demonstrating the predictive value of the test through independent, peer-reviewed published research (Insight Assessment, 2015).

Conclusion

At its conclusion, the study provided sufficient data to answer the research questions within the constraints and limitations described herein. This research suggests that subjects who experience simulation emerge stronger in attributes that are associated with critical thinking. The simulation provided the opportunity for subjects to draw from a broad base of skills in order to interact with a complex environment, as well as the experiential learning necessary to stimulate reflection and, ultimately, the development of abstract concepts. A model to suggest a relationship between simulation and experiential learning was introduced, and a possible relationship between leadership styles, experiential learning, and critical thinking was inferred.

The research demonstrates that subjects recognized the value of simulation for their own learning; they emerged from the simulation experience with perspectives on the complexity of group dynamics and a clearer understanding of the impact of their own leadership. Data collected from faculty demonstrate the value of simulation as a tool in health administration education. Faculty believed that simulation could be a valuable tool in teaching leadership and ethics, and they recognized that simulation could be employed as a capstone tool to integrate learning gleaned from the undergraduate health administration program.

In the end, this research raises important issues that can become the basis for future educational and healthcare administration discipline-specific research on the relationship between simulation, experiential learning, critical thinking, and leadership styles.

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Appendix A

The California Critical Thinking Disposition Inventory

Please answer each question below.

What is your ethnicity?

What is your major?

What year of college are you currently in?

Directions

Indicate how strongly agree or disagree with each of the 75 numbered statements by filling in the appropriate place.

1. Considering all the alternatives is a luxury I can't afford.

   Agree Strongly O O O O O O Disagree Strongly

2. Studying new things all my life would be wonderful.

   Agree Strongly O O O O O O Disagree Strongly

3. The best argument for an idea is how you feel about it at the moment.

   Agree Strongly O O O O O O Disagree Strongly

4. My trouble is that I'm easily distracted.

   Agree Strongly O O O O O O Disagree Strongly

5. It is never easy to decide between competing points of view.

   Agree Strongly O O O O O O Disagree Strongly

6. It bothers me when people rely on weak arguments to defend good ideas.

   Agree Strongly O O O O O O Disagree Strongly

7. The truth always depends on your point of view.

   Agree Strongly O O O O O O Disagree Strongly

8. It concerns me when I might have biases of which I am not aware.

   Agree Strongly O O O O O O Disagree Strongly

9. I always focus the question before I attempt to answer it.

   Agree Strongly O O O O O O Disagree Strongly

10. I'm proud that I can think with great precision.

    Agree Strongly O O O O O O Disagree Strongly

11. We can never really learn the truth about most things.

    Agree Strongly O O O O O O Disagree Strongly

12. If there are four reasons in favor and one against, I'd go with the four.

    Agree Strongly O O O O O O Disagree Strongly

13. Men and women are equally logical.

    Agree Strongly O O O O O O Disagree Strongly

14. Advice is worth exactly what you pay for it.

    Agree Strongly O O O O O O Disagree Strongly

15. Most college courses are uninteresting and not worth taking.

    Agree Strongly O O O O O O Disagree Strongly

16. Tests that require thinking, not just memorization, are better for me.

    Agree Strongly O O O O O O Disagree Strongly

17. I can talk about my problems for hours and hours without solving anything.

    Agree Strongly O O O O O O Disagree Strongly

18. Others admire my intellectual curiosity and inquisitiveness.

Agree Strongly O O O O O O Disagree Strongly

19. Even if the evidence is against me, I'll hold firm to my beliefs

Agree Strongly O O O O O O Disagree Strongly

20. You are not entitled to your opinion if you are obviously mistaken.

Agree Strongly O O O O O O Disagree Strongly

21. I pretend to be logical, but I'm not.

Agree Strongly O O O O O O Disagree Strongly

22. It is easy for me to organize my thoughts.

Agree Strongly O O O O O O Disagree Strongly

23. Everyone always argues from their own self interest, including me.

Agree Strongly O O O O O O Disagree Strongly

24. Open-mindedness has limits when it comes to right and wrong.

Agree Strongly O O O O O O Disagree Strongly

25. It is important to me to keep careful records of my personal finances.

Agree Strongly O O O O O O Disagree Strongly

26. When faced with a big decision, I first seek all the information I can.

Agree Strongly O O O O O O Disagree Strongly

27. My peers call on me to make judgments because I decide things fairly.

Agree Strongly O O O O O O Disagree Strongly

28. Being open-minded means you don't know what's true and what's not.

Agree Strongly O O O O O O Disagree Strongly

29. Banks should make checking accounts a lot easier to understand.

Agree Strongly O O O O O O Disagree Strongly

30. It is important to me to understand what other people think about things.

Agree Strongly O O O O O O Disagree Strongly

31. I must have grounds for all my beliefs.

Agree Strongly O O O O O O Disagree Strongly

32. Reading is something I avoid, if possible.

Agree Strongly O O O O O O Disagree Strongly

33. People say I rush into decisions too quickly.

Agree Strongly O O O O O O Disagree Strongly

34. Required subjects in college waste time.

Agree Strongly O O O O O O Disagree Strongly

35. When I have to deal with something really complex, it's panic time.

Agree Strongly O O O O O O Disagree Strongly

36. Foreigners should study our culture instead of us always trying to understand theirs.

Agree Strongly O O O O O O Disagree Strongly

37. People think I procrastinate about making decisions.

Agree Strongly O O O O O O Disagree Strongly

38. People need reasons if they are going to disagree with another's opinion.

Agree Strongly O O O O O O Disagree Strongly

39. Being impartial is impossible when I'm discussion my own opinions.

Agree Strongly O O O O O O Disagree Strongly

40. I pride myself on coming up with creative alternatives.

Agree Strongly O O O O O O Disagree Strongly

41. Frankly, I am trying to be less judgmental.

Agree Strongly O O O O O O Disagree Strongly

42. Frequently I find myself evaluating other people's arguments.

Agree Strongly O O O O O O Disagree Strongly

43. I believe what I want to believe.

Agree Strongly O O O O O O Disagree Strongly

44. It is just not that important to keep trying to solve difficult problems.

Agree Strongly O O O O O O Disagree Strongly

45. I shouldn't be forced to defend my own opinions.

Agree Strongly O O O O O O Disagree Strongly

46. Others look to me to establish reasonable standards to apply to decisions.

Agree Strongly O O O O O O Disagree Strongly

47. I look forward to learning challenging things.

Agree Strongly O O O O O O Disagree Strongly

48. It makes a lot of sense to study what foreigners think.

Agree Strongly O O O O O O Disagree Strongly

49. Being inquisitive is one of my strong points.

Agree Strongly O O O O O O Disagree Strongly

50. I look for facts that support my views, not facts that disagree.

Agree Strongly O O O O O O Disagree Strongly

51. Complex problems are fun to try to figure out.

Agree Strongly O O O O O O Disagree Strongly

52. I take pride in my ability to understand the opinions of others.

Agree Strongly O O O O O O Disagree Strongly

53. Analogies are about as useful as a sailboat on a freeway.

Agree Strongly O O O O O O Disagree Strongly

54. You could describe me as logical.

Agree Strongly O O O O O O Disagree Strongly

55. I really enjoy trying to figure out how things work.

Agree Strongly O O O O O O Disagree Strongly

56. Others look to me to keep working on a problem when the going gets tough

Agree Strongly O O O O O O Disagree Strongly

57. Getting a clear idea about the problem at hand is the first priority.

Agree Strongly O O O O O O Disagree Strongly

58. My opinion about controversial topics depends a lot on who I talk to last.

Agree Strongly O O O O O O Disagree Strongly

59. No matter what the topic, I am eager to know more about it.

Agree Strongly O O O O O O Disagree Strongly

60. Question unavailable.

Agree Strongly O O O O O O Disagree Strongly

61. Question unavailable.

Agree Strongly O O O O O O Disagree Strongly

62. Many questions are just too frightening to ask.

Agree Strongly O O O O O O Disagree Strongly

63. I am known for approaching complex problems in an orderly way.

Agree Strongly O O O O O O Disagree Strongly

64. Being open-minded about different world views is less important than people think.

Agree Strongly O O O O O O Disagree Strongly

65. Learn everything you can, you never know when it could come in handy.

Agree Strongly O O O O O O Disagree Strongly

66. Life has taught me not to be too logical.

Agree Strongly O O O O O O Disagree Strongly

67. Things are as they appear to be.

Agree Strongly O O O O O O Disagree Strongly

68. If I have to work on a problem, I can put other things out of my mind.

Agree Strongly O O O O O O Disagree Strongly

69. Others look to me to decide when the problem is solved.

Agree Strongly O O O O O O Disagree Strongly

70. I know what I think so why should I pretend to ponder my choices.

Agree Strongly O O O O O O Disagree Strongly

71. Powerful people determine the right answer

Agree Strongly O O O O O O Disagree Strongly

72. Question unavailable.

Agree Strongly O O O O O O Disagree Strongly

73. Others are entitled to their opinions, but I don't need to hear them.

Agree Strongly O O O O O O Disagree Strongly

74. I am good at developing orderly plans to address complex problems.

Agree Strongly O O O O O O Disagree Strongly

75. To get people to agree with me I would give any reason that worked.

Agree Strongly O O O O O O Disagree Strongly

Appendix B

Interview Questions Post-Experience

Student

- Describe the biggest challenge you faced during the simulation experience.
- Provide a brief assessment of each of the characters.
- Briefly describe how you would approach each character in the future.
- What, if anything, did you learn from the simulation experience?

Faculty

- What were the strengths of the simulation experience?
- What were the weaknesses of the simulation experience?
- What, if any, conceptual and/or technical competencies learned in the program were demonstrated through the simulation?

Appendix C

Details of the Experiment

Research environment. The simulation laboratory will be outfitted to look like a conference room with a large table and chairs. The room will be electronically monitored so faculty can observe and hear the interactions as they occur. The simulations will be videotaped for later use as a teaching or research tool.

Simulation background story. St. John's Place is a 100-bed long-term care facility in South Philadelphia. The organization has a long history in the community. First opened in the early 20th century, St. John's started as a 300-bed acute care hospital founded to serve the needs of an immigrant population.

For many years, St. John's Hospital quietly conducted business without any unnecessary interaction with the outside world. It held fast to a sectarian mission of service above all else; and its patients and staff, mostly members of the service community, were committed supporters of what they considered "their hospital."

In the latter part of the 20th century, St. John's Hospital began to fall on hard times. Changes in reimbursement, population shifts, and competition took their toll, and SJH found that it could no longer keep pace in an environment that appeared to be spinning out of control.

In 1995, with bankruptcy looming, Medical Industries, Inc., a for-profit corporation with a reputation for salvaging distressed hospitals, acquired SJH. MI immediately implemented a program of changes designed to save St. John's from closing: Bed capacity was cut from 300 to 200, 30 percent of staff was cut, work

processes were redesigned, and the hospital's mission was retooled to reflect MI's commitment to education, partnerships, and technical advancement.

The ensuing changes did save St. John's Hospital from closing. However, the organization began to look very different from the once familiar, altruistic community hospital. The new administrators, with their dark suits and talk of efficiency, implemented a formal budgeting process and required frequent updates on progress toward clinical and business goals. Staff turnover was unprecedented for SJH, but a few loyal workers held steadfast to their commitment to the old St. John's and remained, despite their reservations about the new regime.

As the topography of healthcare continued to evolve, so did the situation at St. John's Hospital. By the early 2000s, changes in the environment were making it impossible for SJH to survive as an acute care hospital. In 2008, Medical Industries, Inc. sold St. John's to Continuum Care, a for-profit, long-term care company with facilities throughout the US.

Continuum Care changed SJH's name to St. John's Place and converted it into the 100-bed long-term care facility it is today. With a new mission, new management, and a new look, St. John's is nothing like the once familiar hospital. Once again, there has been a large turnover of staff, but a few managers loyal to the old mission have chosen to stay. Morale is low and there are clear-cut divisions between the old St. John's Hospital staff and the new workers brought in with the latest takeover.

For the first time in several years, St. John's Care is operating at a small profit and jobs are relatively secure. A new assistant administrator has just been hired at the center,

the third in the last 5 years. The new AM has been charged with designing an initiative to promote collaboration in the workplace.

Characters. "Sara Walters" is the Director of Outreach. She has been with St. John's Center for 5 months and is enthusiastic about doing a good job. Sara's attempts to make change have been met with resistance and hostility from staff and other managers. Consequently, Sara is intimidated by her coworkers and does not feel safe in openly expressing her opinions. She remains quiet in meetings, and when pressed for feedback, Sara tends to agree with whoever appears to dominate the discussion. Unbeknownst to the other staff, Sara is actively looking for another job.

"John Rogers" is the Director of Clinical Staff. He has been with St. John's for 25 years, and has lived through all the changes. John is a member of the old guard and remains loyal to the original mission, although he will not say so publically. Instead, John is aggressive in dealings with coworkers; he can be critical, sarcastic and negative, and he has no qualms about expressing his opinions, especially when they differ from those of the current leadership. John has good ideas but he keeps them to himself. He is of the opinion that the current leaders should stew in their own juices.

"Renee Martin" is the Director of Admissions. She has been with the organization for 18 years and, until recently, was a go-getter and highly supportive of the changes at St. John's. Unbeknownst to others in the room, Renee applied for the Assistant Administrator job but was rejected because she lacks the necessary educational credentials. Consequently, Renee has become somewhat sullen and withdrawn; she is angry and no longer feels valued by the organization. Once a motivated and enthusiastic

member of the management team, Renee now will agree to almost anything if it will bring an end to the meeting.

Simulation scenario. It is the assistant administrator's second day on the job. As a first step in evaluating the organizational culture, he/she has called a meeting of the department heads to discuss various issues and challenges that are important to staff. The assistant administrator arrives 5 minutes early for the meeting and finds that all three of the department heads are already there. No one is talking and there is an uneasy feeling in the room.

Student role. Playing the part of assistant administrator, the student will conduct an initial meeting with three department heads, each of whom has motivations that are unknown to the student.

Faculty role. Program faculty will be invited to observe the simulation exercises and provide feedback to help answer the research questions. Faculty will not be directly involved in the simulation exercise.

Practice objectives for students. The simulation experience will provide students with an opportunity to practice skills learned in the undergraduate health administration program at Centerville University. The student will be expected to proactively manage and facilitate a meeting with a diverse set of individuals, encourage feedback from each character using open-ended questions, respond positively to feedback from each character, and close the meeting on a positive note.

Learning objectives for students. The simulation experience will provide students with an opportunity to use critical thinking to assess and evaluate each character, and to begin to formulate a strategy for future interactions with that character.

Objective for faculty. The simulation exercises will expose faculty to actor simulation as a teaching tool, and provide faculty with the opportunity to evaluate whether or not simulation has the capacity to integrate conceptual and technical competencies learned in the program.

Appendix D

Student Flyer

UNIVERSITY

Drexel University

Recruiting Volunteers for a Research Study

Research Title

"The Effect of a Standardized Participant Simulation Learning Experience on the Critical Thinking Skills of Undergraduate Health Administration Students"

Research Objectives*

The purpose of this research study is to observe the effect of a simulation experience on the critical thinking skills of undergraduate students in health services administration.

There are two levels of participation in this research:

Levell- Participants will complete an online survey to assess critical thinking skills. The survey consists of 75 questions that are rated on a five point scale from agree strongly to disagree strongly. The survey should take approximately 10 minutes of your time. The total time commitment for participation at level 1is approximately 10 minutes.

Level 2 – Participants will complete an online survey to assess critical thinking skills, then participate in the simulation experience and, finally, complete the online assessment of critical thinking skills once again. The pre- and post-simulation survey consists of 75 questions that are rated on a five point scale from agree strongly to disagree strongly. The survey should take approximately 10 minutes of your time each time it is taken. The simulation scenario is a boardroom meeting between you (a new administrator) and three department heads (actors). Playing the part of the new administrator, you will hold a short meeting to greet and get to know the department heads. At the conclusion of the simulation, you will be asked to fill out a short questionnaire. Additionally, the researcher may randomly choose participants for a brief post-simulation interview. The total time commitment for participation at level 2 is approximately 30-40 minutes.

Information for Research Subjects Eligibility

Students in the undergraduate health administration program are eligible to participate in the research.

Remuneration

There is no compensation in the form of payment for participation in this study. Students who participate at level 2 will be entered into a lottery for a prize (TBD). The prize drawing will occur at the conclusion of the research study.

Location of the research and person to contact for further information
If you are interested in participating in this study, please contact

Prof. Fred DiCostanzo
Fjd25@drexel.edu
267-359-5557

This research is conducted by a researcher who is a member of Drexel University.

Appendix E

Faculty Flyer

UNIVERSITY

Drexel University

Recruiting Faculty Volunteers for a Research Study

Research Title

"The Effect of a Standardized Participant Simulation Learning Experience on the Critical Thinking Skills of Undergraduate Health Administration Students"

Research Objectives*

The purpose of this research study is to observe the effect of a simulation experience on the critical thinking skills of undergraduate students in health services administration.

Fred DiCostanzo is recruiting Health Administration faculty to observe one or more simulation experiments to be conducted December 9-11, 2014 in NCB Simulation Laboratory. Each simulation will run for 15 minutes and faculty will observe from a secluded control room and then complete a short opinion survey

For further information or to participate in the study, please contact:

Prof. Fred DiCostanzo
Fjd25@drexel.edu
267-359-5557

This research is conducted by a researcher who is a member of Drexel University.