ABSTRACT

Christine Wilson, DEVELOPING STUDENTS' COMMUNICATION SKILLS THROUGH VIRTUAL ROLE PLAY ACTIVITIES (Under the direction of Dr. Kermit Buckner). Department of Educational Leadership, March 2019.

Employers have reported difficulty in finding employees who possess the skills needed to be successful. Surprisingly, the skills to which employers are referring are not the technical skills one would assume; instead, the skills being sought are interpersonal skills such as communication, critical thinking, professionalism, and decision-making. Students are entering careers with undergraduate and graduate degrees that provided them with the knowledge required for their chosen fields but without the interpersonal skills necessary to be successful. Higher education is finally acknowledging that their role in a student's future must go beyond preparing their students solely with theoretical information and instead provide the knowledge and skills to prepare graduates for their future careers. By incorporating active learning, such as virtual role play within programs like Mursion®, students experience real-life situations to learn and practice situations they will encounter once they enter the workforce. Mursion® is an immersive simulation tool that includes avatars with whom students can interact in a variety of situations and environments. In this study, Mursion® provided opportunities for students to practice interpersonal skills in realistic situations they are likely to face in real life. . The study examined students who used the tool as part of course curriculum, and those who did not to find if context was relevant. It also looked at the role repeated practice and feedback play in the student perceived outcomes. This study was designed to investigate the effect virtual role play activities had on developing students' communication skills through the use of Mursion®. The results of the study indicated that after interacting with Mursion students perceived benefit in their communication skills and reported they felt more confident going into similar situations.

The qualitative results showed that multiple interactions were beneficial but were the most beneficial when coupled with coaching and/or feedback. Eighty-four percent reported some level of satisfaction with their experience, and over two-thirds would elect to use Mursion® on their own time to practice.

DEVELOPING STUDENTS' COMMUNICATION SKILLS THROUGH VIRTUAL ROLE PLAY ACTIVITIES

A Dissertation

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by

Christine Wilson

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DEVELOPING STUDENTS' COMMUNICATION SKILLS

THROUGH VIRTUAL ROLE PLAY ACTIVITIES

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DEDICATION

In memory of my husband, Jamie D. Wilson, who always believed in me and made it possible for me to pursue my dreams.

This is also dedicated to my loving family who have stood by me through the years. Without your love, support, and patience, I never would have had the strength to persevere and accomplish such a goal.

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CHAPTER 1: INTRODUCTION

Background of the Study

Lynne Williams, a professor at Kaplan University, said, "Technology becomes obsolete quite rapidly; good communication skills remain with you throughout your working life" (Business Wire, 2013). Employers agree that interpersonal communication skills and self-confidence are vital when hiring new graduates regardless of the field (Abadel & Hattab, 2014; Ahmad & Pesch, 2017; Briggeman & Norwood, 2011; Business Wire, 2013; Clokie & Fourie, 2016; Hart Research Associates, 2016; Harun, Salleh, Baharom, & Memon, 2017; Stevens, 2005; Stewart, Wall, & Marciniec, 2016) When asked, students tend to feel more confident about their competence in these skills than either employers or faculty (Ahmad & Pesch, 2017; Hart Research Associates, 2016; Stewart et al., 2016).

Until recently, students and employers believed that the purpose of higher education is to make the students more employable. With the possible exception of workforce development and licensure programs, universities historically, however, held the view that their role was to create well-rounded citizens. Consequently, university graduates may be well-rounded and able to debate on a wide range of topics, but they do not come away with the skills employers require (Harun et al., 2017). Despite the belief that a University education prepared well-rounded citizens, increasingly students expected higher education to provide them with employment opportunities. In 2007-2008, for example, of the over 1.5 million degrees that were granted the largest categories were 21% in business, 10.5% in social science and history, 7% in health science, and 6.5% in education (Natale & Doran, 2012). The emphasis on theory, as noted above, produces graduates with a theory-practice gap that needs to be overcome (Allen, 2009).

Traditionally students were taught theoretical knowledge with the expectation that the graduate will apply this knowledge to the skills they must use in the workplace. Today, many program areas believe that students benefit from active learning opportunities in the form of role play to develop the requisite workplace skills. Active learning is a student-centered approach in which students engage in an activity that requires them to reflect on the application of theory to practice. Students often participate physically in activities that cause them to gather information, think, and problem solve (Michael, 2006). One area that is probably best known for active learning is in the field of medicine, in which is medical training is moving in the direction of simulation (Abadel & Hattab, 2014; Bogam, 2014; Sperling, Clark, & Kang, 2013). It is difficult in this time to imagine a doctor moving from a classroom setting to a hospital setting with no opportunity to practice not only the medicine but also the human interaction prior to encountering live patients, before training with live patients, earning their license, and practicing on their own. At the university at which this study was conducted (which will be identified as Eastern University in the remainder of this study), medical students have an opportunity to participate in simulations in the medical school's Office of Simulation and Safety Education's lab. In that lab, medical students are confronted with an array of common situations whose complexity includes the interactive as well as the medical conditions through simulations. Those interactions in simulated medical settings provide authentic situations and experiences to better prepare the students to practice medicine. The use of the simulations realizes the vital discovery-based and inquiry-based learning approaches characterized by a focus on ideas and concepts, 'learn-by-doing' student motivation, and the notion that the content and the process are inseparable (Michael, 2006).

In Spring 2016, at Eastern University, the use of Interactive Simulation Activities (ISAs) in educator preparation utilizing the Mursion®/TeachLivE™ interactive simulator within an elementary classroom management course was piloted. Students were able to use Mursion® to practice managing varying levels of behaviors in the classroom. Mursion® is an immersive learning experience that provides students with a safe space in which they can practice what they have learned in the classroom. It provides them with opportunities to get direct feedback from virtual students, peers, and their professor. Through Mursion® ISAs, undergraduate and graduate college students practice communication skills they will later use on the job, but the technology is a recent innovation, and though much research has already been conducted on how it can be used to enhance teacher training (Bousfield, Hynes, Hughes, Dieker, Straub, & Ingraham, 2015; Bousfield, Dieker, Hughes, & Hynes, 2016; Hayes, Hardin, Dieker, Hynes, Hughes, & Straub, 2013; Hayes, Straub, Dieker, Hughes, & Hynes, 2013; Medow & Lassman, 2013; Straub, Dieker, Hynes, & Hughes, 2014; Whitten & Wallace, 2014), little research about the effects it can have on those in or entering into other fields is published. Mursion® began as TeachLivE™ at the University of Central Florida (UCF) as a tool to train teachers, but in 2016 it expanded to offer environments that would be beneficial to professionals in other fields such as healthcare, hospitality, and business, among others. The work that has been done thus far in the field of education has shown to be very effective in the training of teachers. The concept and technology for Mursion® were developed within the last 10 years at UCF as TeachLivE™ (Dieker, Hynes, Hughes, Hardin, & Becht, 2015), but was licensed and is now commercially available as Mursion® (Will, 2016).

In 2017, Mursion® released a new line of environments which included four conference rooms, several offices, a retail setting, a hospitality setting, two classrooms, and a medical office.

Mursion® now includes 12 adult and children avatars which are interchangeable among the various environments.

Theoretical Framework

People talk to other people every day. We assume that people have conversations every day with others, but what is the content and purpose of these conversations? Are the conversations deep and meaningful? Do they even take place in person? In past generations, some of these questions were taken for granted, but today's generation is different from every other generation that has come before (see Table 1). Most of today's traditional students are known as the millennial generation. It includes those who were born between 1980 and 2000, are being raised in a more digital age, and have been heavily influenced by computers (Moore, 2007; Ng, Schweitzer, & Lyons, 2010; Smith & Nichols, 2015). Previous generations can find millennials challenging to work with because they seem entitled or overconfident to them. Along with digital and technological experiences that expand upon the way in which this generation both works and communicates, the expectations and ways in which this generation earn recognition is considered different, for example, millennials typically have been given trophies for participating, not just for winning (Moore, 2007, p. 43; Smith & Nichols, 2015). Among other factors, retirement packages, or lack thereof, are changing the landscape of the American workplace. For the first time, it is not uncommon for an organization to employ workers that range in age from 16 to over 65 (Wilson, 2009). This generation range causes a unique set of issues for the workplace (Borya, 2013). The traditional university class preparing students to enter this changing workplace consists of individuals who are all typically in the same age bracket, leaving role play limited in its effectiveness because it does not provide the opportunity to interact with individuals who are of different ages and/or, in the case of many of the programs,

Table 1

Generational Characteristics – 1922-2000

Characteristics	Veterans	Baby Boomers	Generation X	Millennials
Date of birth	1922-1945	1946-1964	1965-1980	1980-2000
Core values	Respect, discipline	Optimism, involvement	Cynicism, informality	Clarity, flexibility
View of work	An obligation	Self-fulfillment	Entrepreneurship	A mechanism for success
Satisfaction from	A job well done	Making a difference	Changing the rules	Lots of recognition
Preferred rewards	Delayed and intrinsic (did their duty, private praise)	Primarily intrinsic (feeling good about self)	Extrinsic (recognition through time, money and freedom)	Very extrinsic (recognition through immediate praise, opportunity, and status)
Communication style	Formal; letters and memos	Face-to-face discussion, meetings	Direct; comfortable with technology	Constant connection; heavy reliance on technology
Leadership style	Autocratic	Consensual	Confrontational	Passive-aggressive
Loyalty	High	High	Low	Low

Note. (Dainton & Zelley, 2019).

provide variety in gender or ethnicity. A student can pretend to be a different gender, race, age or combination of those, but the further they get from who they are, the more authenticity is left behind. Another difficulty found with traditional role play is determining who plays what role and the connotation that brings with it, especially if, for example, the professor plays the CEO (Kerr, Troth, & Pickering, 2003). Clarification of roles is where virtual simulation can potentially provide a solution. Millennials are already accustomed to video games, so interacting with an avatar may be a small leap, although it may not have crossed their minds as a learning opportunity (Moore, 2007, p. 43). Participants in virtual role play have reported that they feel less anxious and more in control of their practice and learning, as well as able to try different approaches, refine skills, and correct mistakes. Virtual role play puts participants in an immersive environment that allows for social interaction with avatars or virtual humans (Park, et al., 2011). For this study, Mursion® was the tool used to allow students to participate in virtual role play activities under the guidance of their instructors. (Borya, 2013). The traditional university class preparing students to enter this changing workplace consists of individuals who are all typically in the same age bracket, leaving role play effective, but still only typically reaching a single generation or in the case of many of the programs a lack of variety in gender or ethnicity.

Purpose of the Study

Students earning undergraduate and graduate degrees are entering their chosen fields prepared with the required knowledge, but without the communication skills necessary to be successful (Business Wire, 2013). In fact, LinkedIn CEO Jeff Weiner reported in a CNBC interview that as more companies use communication and collaboration strategies, there is a heavier emphasis on interpersonal communication; a job skill many American employees across

the country are lacking (Umoh, 2018). Practicing these skills, while still earning their degrees is a perfect time (Natale & Doran, 2012; Wolff & Booth, 2018) for students to earn the full package and be ready to step into their first post-college job. Mursion® simulations help with student preparedness by joining together theoretical knowledge learned in the classroom, and applied knowledge gained through practice and reflection, thus giving students an opportunity to interact in real-life situations they may face in the workplace. This study examined how useful Mursion® simulations were at developing student preparedness by providing the opportunity to integrate the theoretical knowledge they learned in the classroom with applied knowledge they gained by practicing and reflecting. Research has shown that multiple experiences with Mursion® simulations are most beneficial (Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014).

The purpose of this study was to identify the impact practice using Mursion® simulations in situations university students are likely to encounter in their fields would have on the students' self-perceived communication skills. This purpose aligns with the goals of the instructors who use Mursion®, which is for their students to be able to communicate professionally. In the past, instructors have used the traditional role play method in the classroom, but it has not yielded the desired results. It has been shown that peer role play may have flaws in "validity" as peers may be overly cooperative in order to be helpful and it may evoke powerful feelings that could effect actual relationships with classmates (Mooradian, 2008). This study focused primarily outside of K-12 teacher preparation because most of the published research on the effectiveness of TeachLivE™ or Mursion® has been in the area of K-12 preparation (Bautista & Boone, 2015; Billingsley & Scheuermann, 2014; Bousfield, et al., 2015; Bousfield, et al., 2016; Dieker L. , Hynes, Hughes, Hardin, & Becht, 2015; Dieker L. , Hynes, Hughes, & Smith, 2008; Dieker,

Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014; Garland, Holden, & Garland, 2016; Garland, Vasquez, & Pearl, 2012; Hayes, Straub, Dieker, Hughes, & Hynes, 2013).

The study examined students' perceptions of their own interpersonal communication skills and how those skills may or may not have developed through Mursion® by analyzing students' self-reported beliefs about their interpersonal communication skills before and after their Mursion® experience. The study also examined the views of students and instructors about the Mursion® experience itself and whether it prepared them for their careers.

The study was conducted at "Eastern University," a southern, public, doctoral/research university with over 29,000 students in nine undergraduate colleges, a graduate school, and four professional schools, including medical and dental schools.

Research Questions

The research questions that guided this study were:

1. How do students' self-perceived views of their ability to communicate change after they have participated in at least one Mursion® activity that was embedded in the course curriculum?
2. How does the amount of exposure to Mursion® affect student interpersonal communication skills?
3. How do students' self-perceived views of their ability to communicate change after they have participated in at least one Mursion® activity not embedded in the course curriculum?

As of Spring 2018, Eastern University had several different Mursion® environments available for education, healthcare, and business (Wilson, 2017). For this study, there was not a focus on any particular environment; instead, the faculty involved were asked to choose the

scenario and environment that were most appropriate for their objectives. Most of the faculty selected the conference and office environments. During the simulation, participants interacted with an environment that displayed one to five avatars on a 90-inch television screen in a room dedicated to Mursion®. In a typical Mursion® session, the faculty member opted to have class members present during the simulations to provide immediate feedback and assistance to the student who was engaged in the interactive simulation. In all sessions, the avatars were operated by a trained human in the background, which helped to provide the realism needed including the realistic responses to the verbal and non-verbal interactions and random directions the conversations took (Dieker, Straub, Hughes, Hynes, & Hardin, 2014; Hughes, Nagendran, Dieker, Hynes, & Welch, 2015, p. 33). Participants also had the opportunity to pause the simulation at any time if they needed to seek advice from their classmates, if in the room, or the faculty member. Once the advice was given, the simulation could then be resumed (Dieker, Straub, Hughes, Hynes, & Hardin, 2014, p. 56).

Significance of the Study

This study aimed to provide insight into how Mursion® can be used in higher education across programs to allow students to practice interpersonal communication skills while applying specific discipline-related knowledge. The results are intended to give leaders in higher education a way to narrow the theory-practice gap when students enter the workforce by giving them opportunities to apply theory and didactic knowledge to realistic experiences. These experiences are similar to what they will face on the job while still having the benefit of being in a safe place where they are able to discuss their experiences with peers and mentors. Much of the current research involving Mursion® is focused primarily on the field of education. This study

intentionally focused on a variety of fields outside of educator preparation to expand on the current field of research.

Communication skills are the number one skill shortage in the country, with the most significant shortages being in the biggest cities. For example, the top skill shortage was Oral Communication in at least five of the largest US cities with New York – 152,411; San Francisco – 112,007; Los Angeles – 64,252; Chicago – 50,057; and Philadelphia – 23,958 more jobs than people with the skill as shown in Table 2 (Economic Graph Forum, 2018). This change to focusing on skills that are less discipline-specific may be attributed to the changing workplace. More and more the contemporary workplace is diverse and uses project teams which include cross-functional, even virtual, teams with members who each contribute different pieces of expertise. As business networks develop across departments, cultures, even time zones, so do the need for clear communication across the entire team and interpersonal awareness (Clokie & Fourie, 2016). As the shift in the purpose of higher education to more effectively prepare students for employment continues to increase (Natale & Doran, 2012) and higher education institutions strive to stay competitive, leaders need to find an efficient way to bridge the skills gap and allow their graduates to enter the workforce with all of the skills they need to be successful. These skills include both those traditionally identified for a particular field and those that will prepare the graduates for the jobs that do not even exist yet. The types of skills this entails include interpersonal communication skills as well as the ability to adapt to new situations and to working with new people. In this study, students were exposed to a new, sometimes uncomfortable, situations and told to converse with avatars regarding a typical career related activity or situation. The study examined how the students performed in the actual activity, but

Table 2

Top Skills Shortages in Major U.S. Cities

Ranking	Skill	New York	San Francisco	Los Angeles	Chicago	Philadelphia
1	Oral Communication	152,411	112,007	64,252	50,057	23,958
2	Leadership	71,115	60,475	29,392	9,572	--------
3	Digital Literacy	69,115	40,477	29,008	--------	--------
4	Business Management	66,900	86,257	29,907	13,538	--------
5	Social Media	65,750	37,526	28,621	11,676	5,523
6	People Management	48,617	--------	20,37	13,533	7,691
7	Research	44,763	--------	17,242	--------	--------
8	Graphic Design	39,122	--------	22,594	7,416	3,181
9	Development Tools	38,231	52,274	18,149	10,425	3,909
10	Time Management	37,880	--------	15,346	11,483	6,642

Note. A skills gap is a mismatch between the skills employers need and the skills workers have. A skill is in shortage in a city when the employer demand exceeds the workers' supply of that skill. The chart shows how much room there is for people with a particular skill in each city. (Economic Graph Forum, 2018).

also what they thought about Mursion® itself and about being in the simulation. This study intends to show how Mursion® can be a viable option to teach interpersonal skills in several disciplines, but administrators will need to take it upon themselves to make its availability a priority.

Definition of Terms

Active Learning - An instructional method that engages students in the learning process by having them involved physically in gathering information, thinking, and problem-solving (Michael, 2006).

Avatar(s) - Computer generated and manipulated children, youth, and adults.

Blackboard - A virtual learning environment and course management system employed at ECU and many other universities nationwide. Tools related to the Mursion® Lab, such as the Mursion® Repository, can be found on this platform.

Ceiling Microphone - This hardware allows for high-quality audio in the Mursion® Lab for greater immersion during the session. Facilitators should ensure that as few people as possible are in the Mursion® Lab during each participant's session. The ceiling microphone will provide audio that is of the highest quality, which will further the suspension of disbelief.

Code Words and Phrases - Words or phrases used to communicate between the Facilitator and Simulation Specialist during a session. Simulation Specialists are trained never to break character during a session.

Communication - How people use messages to generate meanings through all forms, modes, and media (What is Communication, 2016).

Communication Skills - Regularly practiced behaviors and behavioral patterns during interpersonal encounters which help to achieve the desired goal (McCornack, 2016, p. 21).

Experiential Learning - Incorporates many learning principles by motivating learners to solve problems, build on prior experiences, and be actively involved in their own learning. Simulation is an example of this type of learning (Wolff, Wagner, Poznanski, Schiller, & Santen, 2015)

Facilitator - The individual(s) running the technological features of the simulation. In an off-site setting, the Facilitator runs all aspects of the simulation. In the Mursion® Lab on ECU campus, a Mursion@ECU staff member will run the technological aspects of the simulation.

GoReact - A secure online video recording and assessment tool that allows for commenting, tagging, and marking used in this study for analyzing participant Mursion® sessions.

Generational Theory - Starting with the Puritan generation which founded the US, each roughly 20-year generation shares common beliefs and behaviors. Current living generations include Silent Generation aka Veterans, Baby Boomers, Generation X and Millennial Generation (Dainton & Zelley, 2019; Moore, 2007). Table 1 shows the characteristics of each generation.

Interpersonal Communication - A dynamic, transactional form of communication between at least two people in which messages are conveyed influenced by thoughts, emotions, behaviors, and relationships (McCornack, 2016, p. 11).

Lapel Microphone - A microphone that may be worn by participants in the event of technical malfunctions. The batteries are rechargeable; therefore, the Facilitator must ensure they are charging before leaving the Mursion® Lab.

Mediasite - The recording software used to capture the interaction between the participant and avatars while in the Mursion® Lab. Once captured, the video is edited and uploaded to VoiceThread for use in the Mursion® Repository or independently from Blackboard.

Mursion® Hour - In the Mursion® Lab, an hour is actually 50 minutes of actual session time, and the last 10 minutes of the hour are always reserved as a break for the Simulation Specialist. If a session runs over an hour, the 10 minutes still comes after 50 minutes. There are no exceptions to this.

Mursion® Repository - The course designation in Blackboard where Facilitators (instructors) can comment on their own participants' work, as well as the work of participants in other sessions.

Mursion® Scheduler - Found on the Mursion@ECU website, this calendar allows instructors and facilitators seamlessly to schedule live sessions, design sessions, and demonstrate simulations within ECU's Mursion® Lab.

Mursion®, Inc. - The company providing the simulation software. More information is available at www.Mursion.com.

Pre-Developed Scenarios - Written and designed simulation scenarios that can be used repeatedly without having to schedule a test session with the Simulation Specialist.

Role Play - A role play is an interaction that is a mock-up of a real-life interaction with features that would take place in an actual situation (Nguyen, 2018).

Suspension of Disbelief - A willingness to suspend one's critical faculties and believe the unbelievable.

Scenario Design - A plan used for creating and designing an environment unique to the instructor's specific objectives and goals. An instructor's scenario is designed and tested before the simulation can be used.

Simulation - The "real life" experience in the Mursion® Lab.

Simulation Specialist - A highly trained individual who controls up to five avatars during a simulation.

TeachLivE™ - A mixed-reality teaching environment supporting teacher practice in classroom management, pedagogy, and content, which UCF developed. It is in use at over 85 U.S. college campuses and expanding to include multiple school districts and international partners. More information is available at www.TeachLivE.org.

Test Session - A 50-minute practice session required for every custom scenario that is developed. This allows the author(s), facilitator(s), and simulation specialist to run-through and edit as needed. The pre-developed scenarios have already been through the test session and can be used without any further testing required.

VoiceThread - The media software used by the Mursion® Repository to view recordings of participants in the Mursion® Lab. The link to VoiceThread can also be accessed independently from Blackboard and the Mursion® Repository.

CHAPTER 2: REVIEW OF THE LITERATURE

The Great Recession ended in 2009, yet in 2014 when the Department of Labor Statistics first posted experimental tables by the five generations living today, Millennials accounted for half of the 10.9% of unemployed Americans. Gloria Larson, president of Bentley University, attributes this to the fact that 62% of business decision-makers and recruiters believe young college graduates are not prepared, and that unpreparedness harms the productivity of their businesses (Pianin, 2014). Larson continued to suggest that business and higher education need to partner to ensure that graduates are able to learn the real-world skills as well as the technical skills required for the specific jobs employers require. Ten years have passed since the start of the Great Recession, and the unemployment rate has improved across the board, however according to the U.S. Bureau of Labor Statistics, no matter the year chosen from January 1992 to December 2017, the 16 to 24-year-old group has a higher level of employment than the rest of the employable population combined (Cunningham, 2018). As time goes on, if institutions continue to teach as they always have, the result will be more and more graduates that are not prepared for the workforce because the jobs are changing, and graduates must learn to adapt. While in school, students need to learn to direct their own learning, and educators need to emphasize skills such as communication, critical thinking, decision-making, and how to use technology to enhance learning (Moran, 2018). To accomplish this, students need to be actively engaged in their learning experience (Korthagena, Loughranb, & Russell, 2006) and pull knowledge and meaning from real-life experiences (Yardley, Teunissen, & Dornan, Experiential learning, 2012). Mursion® has been found to be an effective tool to practice these types of skills in the field of education and educator preparation by using a virtual reality environment to immerse teachers and teacher candidates into a realistic classroom or meeting environment

(Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014). This chapter will review the literature on active learning, communication, and Mursion®. When discussing active learning, it will follow a path that begins with Experiential learning, a form of active learning; which then leads to role play, a form of experiential learning; and narrowing down to virtual role play a form of role play ending the journey with Mursion®, the tool that will be used in this study, which is a virtual simulation tool that allows for virtual role play with avatars playing the opposite role(s). The communication skills discussion will give an overview of communication skills but will also take a closer look at interpersonal communication skills, specifically how those skills will apply in this study. Finally, the Mursion® discussion will introduce Mursion® and its history. It will also provide background on the research that has been done thus far in the field of education using TeachLivE™ (the predecessor of Mursion®) to show a basis for the selection of the tool being used in this study.

Active Learning

Learning by doing is not a new concept. In fact, learning-centered theory was made possible by work done by John Dewey during the late 19th and early 20th centuries (Rogers, 1994; Weimer, 2013). Dewey (1997) believed that students learned best by doing, not by being passive recipients of a lesson. The idea of constructivism is that learning is an active process and builds on knowledge the learner already possesses (Dewey, 1997; Rogers, 1994; Weimer, 2013). Cognitive Constructivism, as founded by Jean Piaget and Jerome Bruner and Social Constructivism as founded by Lev Vygotsky, both focus on learning by "why" and "how," people learn. Students are encouraged to actively engage in learning by discussing, arguing, negotiating, and collaborating to solve problems (Ruey, 2010). Teachers are trainers and coaches who help the learners gain new knowledge by using techniques like problem-based learning,

situated learning, and experiential learning while becoming self-regulated learners (Rogers, 1994; Weimer, 2013), which begins at the primary school level but continues into higher education. In fact, Barr and Tagg (1995, p. 1) believed faculty, staff and administrators in higher education needed to place a greater emphasis on incorporating constructivist learning theory not only in the curriculum, but in the culture of the institution because "a college is an institution that exists to produce learning as opposed to one that exists to instruct."

Active learning is fundamental to constructivism and involves engaging students in an activity that makes them reflect upon ideas and how they are using those ideas (Michael, 2006). This allows them to assess their own level of understanding and skill at handling the concepts in the activity (Collins & O'Brien, 2003; Prince, 2004). A number of different fields, including Educational Psychology, Chemistry, Biology, Physics, and Physiology support the effectiveness of active learning much more so than passive learning (Michael, 2006). When trying to measure the effectiveness of active learning, it has been difficult because there are so many different interpretations, but one finding that emerges across the literature is an improvement in students attitudes and skills as a result of the activity (Prince, 2004). The effectiveness of active learning is particularly true with adult learning as Malcolm Knowles noted in the 1970's when he started using the term andragogy to differentiate adult learning from child learning (pedagogy) (Knowles, 1978). An essential part of andragogy is that adults cannot be passive learners and instead need to be actively engaged in their own learning (Weiss & Needlman, 1998). Other variables that are distinct to adult learners include the "context of adult lives," which identifies the fact that adults have ongoing responsibilities that will affect their learning that are different from that of children; the "role of experience and prior knowledge." College students are a unique set of adult learners, as they are typically aged 18-25 years. They are of legal adult age,

but most “are not cognitively, emotionally, or socially representative of a mature adult” (Dachner & Polin, 2016, p. 122). This allows for each adult learner’s unique experiential background to be a resource that can be used in new learning; and “differences in the processes of learning,” which acknowledges that each learner has a specific learning style and that each has individual differences in learning when compared to that of a child (Jackson, Barnett, Rosemary Caffarella, & Macisaac, 1992). Experiences, and a student’s ability to remember and evaluate those experiences, are essential to the learning process, but not all experiences affect individuals in the same way (Hagen & Park, 2016). Andragogy’s flexibility allows for, especially with the unique set of learners found in traditional college students, courses and activities to be chosen in a way that is most meaningful as they transition into adulthood (Dachner & Polin, 2016). In addition, when considering the learning pyramid, people learn best when they are actively engaged in the process (Lalley, 2007). Another framework that has an affinity in active learning is Bloom’s Taxonomy.

Bloom’s Taxonomy allows for the establishment of expertise using a multi-tiered approach. The standard approach analyzes knowledge-based goals, but more appropriate for analyzing interpersonal communication skills is Bloom's Taxonomy of Educational Objectives for Skills-Based Goals. The levels of expertise include perception, set, guided response, mechanism, complex overt response, adaptation, and organization (Armstrong, 2018) as demonstrated in Table 3.

Taking it a bit further, Mursion® uses the Problem Based Learning (PBL) approach to Active Learning. PBL presents a problem that the students work to resolve during the lesson. PBL is always active and may be collaborative but can also allow an individual student to work out a solution to the problem on his/her own (Prince, 2004, p. 223). Mursion® can be used as a

Table 3

Bloom's Taxonomy of Educational Objectives for Skills-Based Goals

Level of Expertise	Description of Level	Example of Measurable Student Outcome
Perception	Uses sensory cues to guide actions	Some of the colored samples you see will need dilution before you take their spectra. Using only observation, how will you decide which solutions might need to be diluted?
Set	Demonstrates a readiness to take action to perform the task or objective	Describe how you would go about taking the absorbance spectra of a sample of pigments?
Guided Response	Knows steps required to complete the task or objective	Determine the density of a group of sample metals with regular and irregular shapes.
Mechanism	Performs task or objective in a somewhat confident, proficient, and habitual manner	Using the procedure described below, determine the quantity of copper in your unknown ore. Report its mean value and standard deviation.
Complex Overt Response	Performs task or objective in a confident, proficient, and habitual manner	Use titration to determine the Ka for an unknown weak acid.
Adaptation	Performs task or objective as above, but can also modify actions to account for new or problematic situations	You are performing titrations on a series of unknown acids and find a variety of problems with the resulting curves, e.g., only 3.0 ml of base is required for one acid while 75.0 ml is required in another. What can you do to get valid data for all the unknown acids?
Organization	Creates new tasks or objectives incorporating learned ones	Recall your plating and etching experiences with an aluminum substrate. Choose a different metal substrate and design a process to plate, mask, and etch so that a pattern of 4 different metals is created.

Note. (Armstrong, 2018).

collaborative experience where several students are together in the lab, but that is not a requirement. In a collaborative environment, students can learn from each other's experiences and help each other to problem-solve to arrive at the best solution to the presented scenario. Researchers have been trying to establish whether or not PBL enhances academic achievement similar to exams, but so far have not been able to find any evidence to that effect. They have, however, found that it develops a more positive attitude in students and a more profound approach to the learning, which helps students to retain the information for a more extended period of time than traditional instruction (Prince, 2004). One such collaborative learning experience that facilitates this is role play (Stevens, 2015).

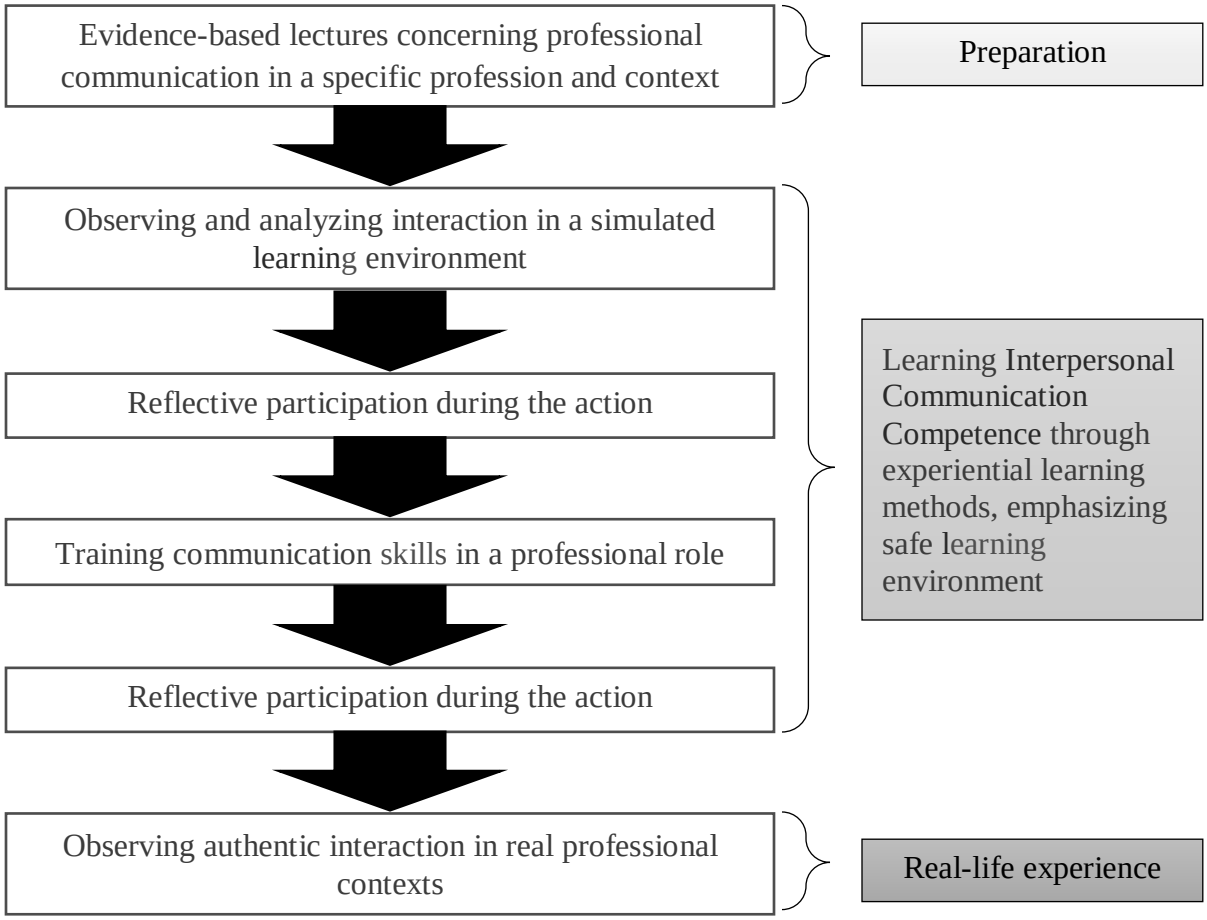
Experiential Learning

Dewey advocated that students should have the freedom to play active rather than passive roles in learning. This could be done by connecting their life experiences to their learning, and teachers should influence the direction of the learning through their instructional approach (Dewey, 1997). An example of active learning, incorporating roleplay, is demonstrated in the use of simulation in experiential learning (Wolff, Wagner, Poznanski, Schiller, & Santen, 2015), which builds knowledge and meaning from real-life experiences that the learner is actively engaged in and is situated in a context relevant to his or her current or future workplace.

Simulation changes experiential learning slightly by replacing or amplifying real-life experiences with scenarios designed to replicate job-related encounters or to allow learners to play a role to better understand specific concepts or theories (Wolff et al., 2015). With experiential learning, learning and experience are interdependent because while learning changes with increasing experience, previous experience also affects how a learner will approach a new experience, which will affect their ability to learn new things (Yardley, Teunissen, & Dornan,

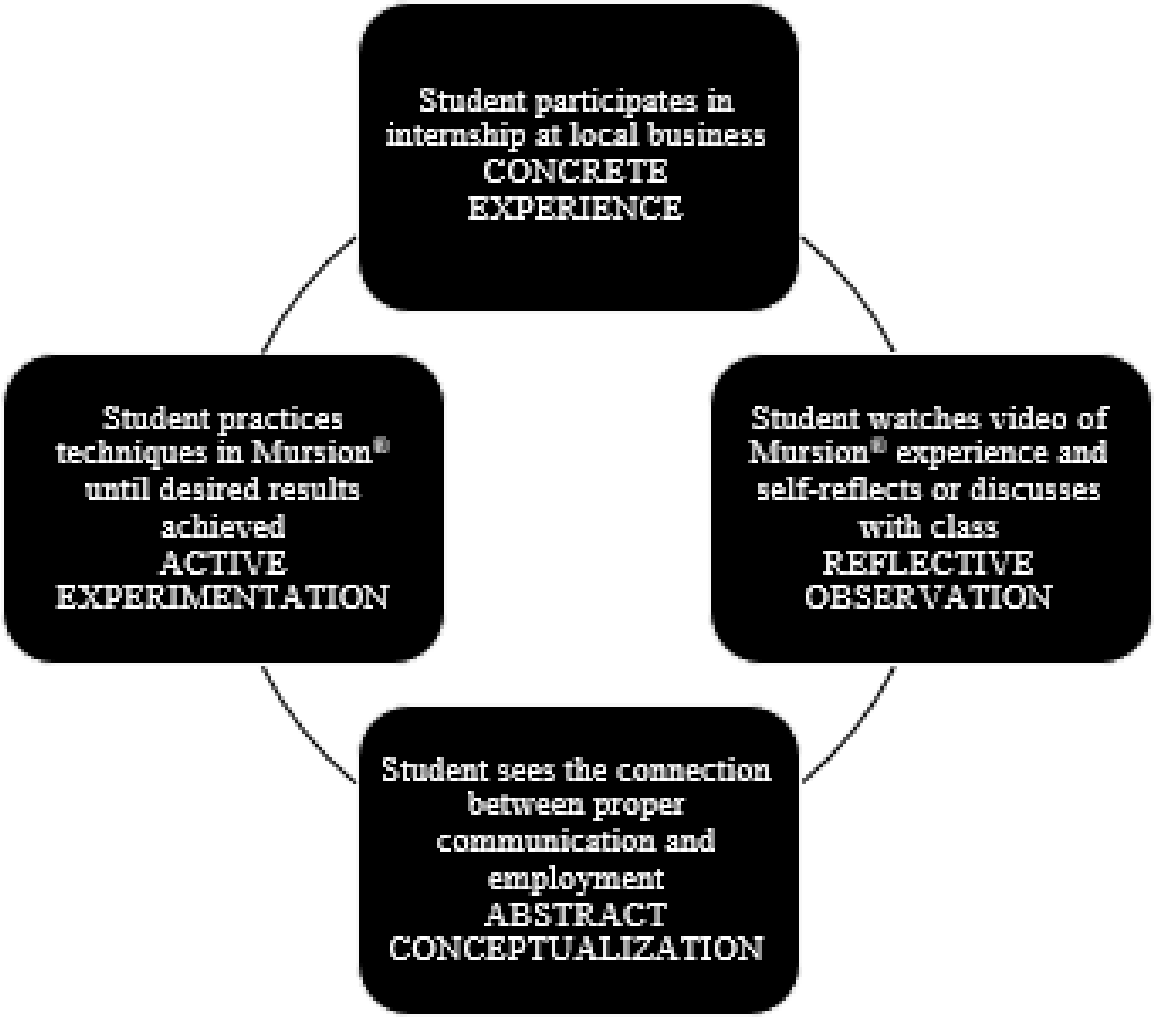
Experiential learning, 2012). Which explains why the type of role play is more important to a student than the number of times he/she experiences it. Experiential learning activities lead to a better understanding of course content and increased course involvement (Adams & Mabusela, 2014).

An example of experiential learning that was relevant to the content of this study was Kopnen, Pyörälä, and Isotalus' (2014) study of the different methods used to teach communication skills to medical students. In the article, the authors compared simulated patients (SP), role play, and Theatre in Education (TIE) method to interpersonal communication competence to medical students. They found that the outcomes for each of the three methods were very similar, and the students' attitudes to learning communication skills became more positive. As part of their findings, the instructional design for a specialty-specific communication training model, represented in Figure 1, was developed to be used when designing a specialty-specific communication training in other disciplines. The model provides a guideline for a curriculum that includes the theory, observation, reflection, practice, more reflection and then observation through experiential learning to provide students with the experiences and knowledge that will best serve. It is important, however, to realize that not all students learn in a straight line thus meriting attention to another theory that applies well to this study, Kolb's four-stage cyclical model of knowledge development (see Figure 2). Kolb theorized learners identify the principles to be learned, decide what that means to them, then assimilate the new principles into their existing knowledge, and finally try out what they have learned (Dack, van Hover, & Hicks, 2016; Yardley, Teunissen, & Dornan, AMEE Guide, 2012). It is important to note that since this is a cyclical model, the learning can start and stop at any stage and can go around the cycle multiple times but is most effective when the student goes through all of the stages. Each



Note. (Koponen, Pyörälä, & Isotalus, 2014).

Figure 1. Instructional design for specialty-specific communication training.



Note. Adapted from Petkus, Jr. (2000).

Figure 2. Student's progress through Kolb's Experiential Learning Cycle with Mursion®.

component of Kolb's cycle could easily apply to any experiential learning experience. The "concrete experience" involves the senses and must bring about some sort of emotional engagement. The "reflective observation" includes watching, listening, recording, discussing, and elaborating of the experience without necessary integrating any academic theories or concepts. "Abstract conceptualization" is the deep-dive thinking phase of the cycle and integrates the theories and concepts into the learning process. Finally, the "active experimentation" is the stage where the student has the opportunity to engage in a trial-and-error process in which the information gained and processed in the other stages is tested in a specific context (Petkus, Jr., 2000).

Role Play

Research suggests that role play has a proven to be an effective pedagogical method across diverse fields of higher education (Ricker, Peterfeso, Zubko, Yoo, & Blanchard, 2018, p. 62; Stevens R. , 2015, p. 481). A role play is an interaction that is a mock-up of a real-life interaction with features that would take place in an actual situation (Nguyen, 2018). This follows a worldwide trend of using role play methods for a variety of disciplines including classroom training, practicing therapy, as well as doctor and nurse training including medical emergencies and communication skills (Adams & Mabusela, 2014; Bristowe, et al., 2012; Craft & Ainscough, 2015; Dack, van Hover, & Hicks, 2016; de Villiers, et al., 2014; Fossen & Stoeckel, 2016; Koponen, Pyörälä, & Isotalus, 2014; Lee, Trim, Upton, & Upton, 2009; Macgowan & Beaulaurier, 2005; Senediak, 2014) Role play gives students an opportunity to practice skills learned in the classroom in a meaningful way (Fossen & Stoeckel, 2016). The students, regardless of their role, also get the added benefit of being able to feel as though they belong to the classroom community (Zumbrunn, McKim, Buhs, & Hawley, 2014). When

engaging in role play in a virtual simulation, students have found that the experience gives them the opportunity to "cope with their anxiety, fear, and doubts before facing future real-life care situations" (Fossen & Stoeckel, 2016). It is important to remember that role play is only considered valid if, as a result of participating in the activity, learning has occurred. Since traditional role play is done by multiple members of a class, Cornelius, Gordon, and Harris (2011) found that some members can negatively affect others, reducing their opportunity, ability (possibly motivation) to contribute, and thereby making it difficult to achieve the activity's objective.

Adams and Mabusela (2014) documented that role play increased empathy in students, improved their interpersonal and communication skills, and fostered autonomy, responsibility, and solidarity. Students who participate in role play also make connections between the role they play and real-life situations. Linking the activity closely with the student's future profession is also beneficial, as it helps them to come to terms with the reality of their chosen profession and prepares them to practice the necessary skills in realistic situations. Should one choose to integrate a role play activity, it is essential to take into consideration the needs of the different learners involved who may be uncomfortable and pay particular attention to learning styles and attributes like anxiety and shyness.

Communication Skills

Just as university students graduate with the technical skills required to enter their chosen career, the ability to communicate information clearly, effectively and accurately is a crucial skill they should possess (Clokie & Fourie, 2016; Sarpparaje, 2016). Developing interpersonal communication skills is more critical for today's college student than ever before because they have been shaped by technology, leaving them with distinct communication differences from

previous generations (Lolli, 2013, p. 295). For millennials, communication through text and social media have been integral components of their communication development and for many may be preferred methods for certain types of communication. In contrast, for older generations, these are not part of their communication development and methodology, and therefore they may prefer face-to-face or phone communication. This demonstrates the differences in communication styles succinct, in the manner of tweets and posts verses elaborate and responsive in the manner of face-to-face and phone.

When students choose a career path, they do not often consider the communication skills that are required for that position, and it is not until they get into the position that they realize their importance. For example, many students believe accountants are professional, but not necessarily personable; however, the reality of an accountant is to be promoted to partner, where communication skills are rated as first or second on the list of desirable skills (Ameen, Bruns, & Jackson, 2010). Generally speaking, to communicate is simply an attempt to have someone share his or her thoughts in any communication mode, written, spoken, or physical language, while the other person infers meaning (Sperber, 1995). Communication requires the transmission of a message through some sort of interaction. The context in which the communication takes place plays a significant role in what is deemed appropriate. For example, how a person communicates with a family member is often very different from how the same person would communicate with a supervisor on the job. In general, these interactions may take the shape of an email, oral conversation, or simply body language or gestures.

Effective communication is a learned skill, and everyone can enhance their skills and become more effective communicators (DeVito, 2016). Practicing communication skills leads to improved performance to the extent that the person becomes aware of their effectiveness in

accomplishing their interaction goals (Greene & Burleson, 2003). Practice, however, is not enough, it is the quality of the practice that matters. If a person practices bad habits, they are likely to grow less effective, so it is important to learn and practice the skills necessary to be effective. Interpersonal communication has more of an immediate impact on all parties involved because it can change the participants' thoughts, emotions, and behaviors. According to McCornack (2016), "the impact on relationships is one of the most profound and unique effects created through interpersonal communication" (p. 11).

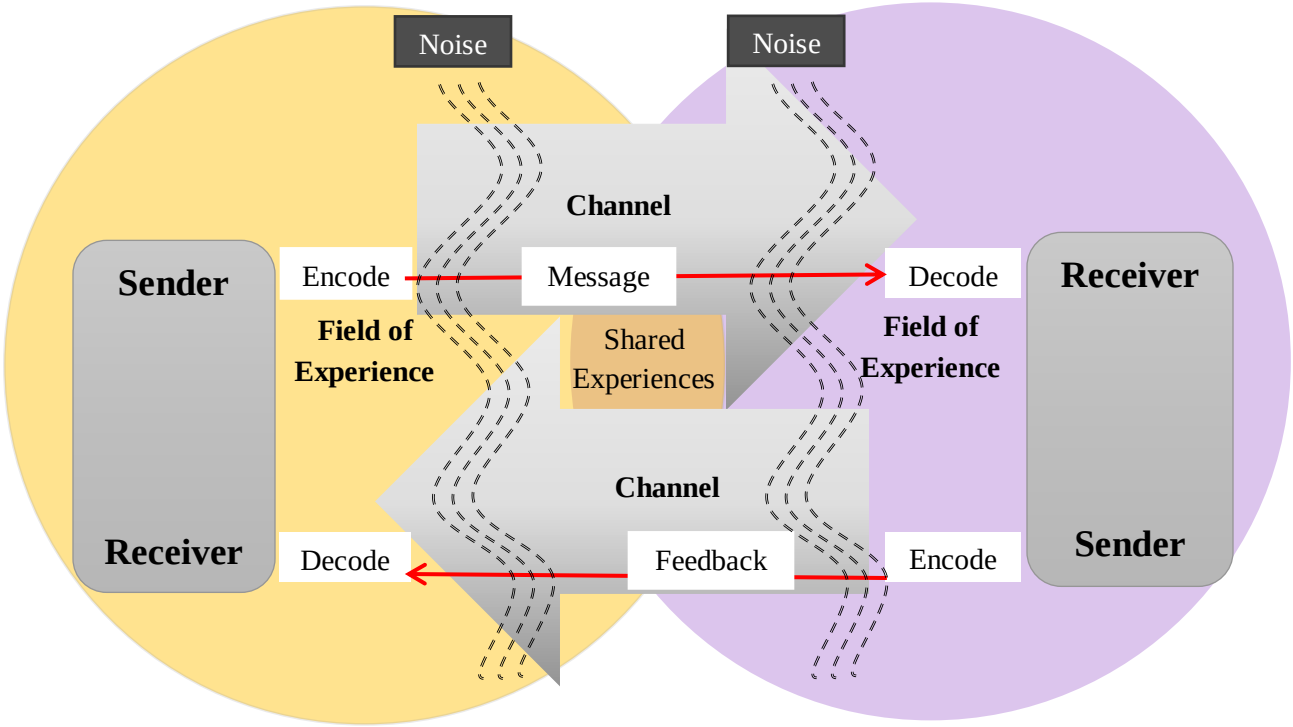
Interpersonal Communication Skills

Interpersonal Communication is not a new concept. In fact, one of the earliest books ever written, in 2200 BC, was a guidebook for enhancing interpersonal skills (McCornack, 2016). The author, Egyptian sage Ptah Hotep, encouraged people to be truthful, kind and tolerant when communicating (Kelley, 2002). He also recommended active listening and to be mindful of word choice. Interpersonal Communication has been and remains vital because it is essential for developing and maintaining relationships in every aspect of a person's life (Braithwaite & Schrodt, 2014; McCornack, 2016). A person's personal and professional success is primarily dependent on the effectiveness of their interpersonal communication (DeVito, 2016).

Interpersonal communication can be intentional or unintentional, is irreversible and dynamic (McCornack, 2016) and can be influenced by culture, gender, race, and individual differences, among other factors (Greene & Burleson, 2003). Meaning can be attached to everything a person says or does, whether an actual message was intended or not (McCornack, 2016). "You don't get a second chance to make a first impression" (Botany 500, 1966) is an accepted maxim that stems from the fact that the message that is received is irreversible. This impression is based not only a person's gender, race, age, and overall appearance, but also on a

person's spoken or written words body language (Whitbourne, 2016). Throughout an interaction, the meaning is generated from cues, such as facial expressions and vocal inflections, and the nature of the interactions themselves, such as the length of the interaction, the topic of conversation, and level of threat, among others (Berger, 2014). Interpersonal communication plays a vital role in an individual's experiences in the workplace throughout their lives but actually begins when a person starts attending school or joins a team (Kramer & Sias, 2014).

When looking at individual conversations, time is a key factor in interpersonal communication because of the patterns of action and reaction by the participants as the conversation transpires (Berger, 2014). Interpersonal communication involves both verbal and nonverbal messages including the words used, facial expressions, eye contact, and body posture, which are likely received through effected senses such as hearing, vision, smell, and touch (DeVito, 2016). Interpersonal communication contains several parts, as shown in Figure 3, including the participant serving as the sender/receiver, the channel through which the message is transmitted, the noise (see Table 4), the processes of encoding and decoding, and the knowledge and experiences of the communicators (Gamble & Gamble, 2014). A break down of some of these parts may be helpful to clarify how they all work together. The channel is the dimension through which the message is transmitted and received, which may be auditory, visual, tactile, olfactory, or oral (McCornack, 2016). Noise is anything that distorts the message and can come in four types: physical, physiological, psychological and semantic (DeVito, 2016). Table 4 breaks down the types of noise and what problems each can cause. There are several possible causes and consequences of ineffective communication, as shown in Table 5. These causes can range from taboos, poor conflict management/ problem-solving skills, a lack of



Note. Adapted from Gamble & Gamble (2014).

Figure 3. Interaction Model of interpersonal communication.

Table 4

Types, Characteristics and Examples of Noise

Type	Characteristics	Examples
Physical Noise	External to participants; impedes the transmission of the message	Passing cars; television; sunglasses; poor grammar
Physiological Noise	Barriers within at least one of the participants	Visual impairment; hearing loss; memory loss; mental deficit
Psychological Noise	Mental interference between participants	Wandering thoughts; preconceived ideas, biases, prejudices; emotionalism
Semantic Noise	Interference caused by participants attributing different meanings to the same things	Language or dialectical differences; use of acronyms or abbreviations; use of jargon or overly complicated terms

Note. Adapted from DeVito (2016).

Table 5

Ineffective Interpersonal Communication: 12 Possible Causes, Consequences, Cures and Examples for Effective Communication

Possible Causes	Possible Consequences or Interpretations	Possible Cures/Strategies	Examples of Possible Wording for Effective Communications
1. Social/ Familial/ Organizational/ Cultural Taboos regarding "No Talk" Issues.	Frustration Helplessness Lack of Trust Substantive Issues are ignored	Talk openly about cultural taboos and how they may have contributed to a climate wherein people are reluctant to share or tackle difficult issues.	"I am not really comfortable bringing this up, but I feel we need to address it." "I am concerned about a patient safety issue that I want to bring to the attention of the team." "There is an issue that is bothering me, and I feel we need to discuss it."
2. Poor Conflict Management Skills	Inappropriate and misdirected anger Finger pointing Blaming	Learn how to respectfully disagree. Become comfortable with affect (yours and others). Remain calm and professional in all situations.	"I can see that you are upset. I would like to discuss this calmly and rationally." "Perhaps we can negotiate a compromise, middle ground?" "It looks like we may not agree on this, so let's table it for now and discuss again."
3. Poor Negotiation/ Problem-Solving Skills	Knee-jerk responses Temporary or short-term fixes (sometimes referred to as "Band-Aids") Focus is on "putting out fires" rather than vision	Learn skills for collaboration. Become comfortable with unfinished (long-term) solutions. Discover your strengths and those of others. Assign or negotiate tasks/workgroups/projects based on individual strengths and interests, versus a "we just need a warm body to complete this" approach.	"If you could do what you enjoy most, what would that be?"

Table 5 (continued)

Possible Causes	Possible Consequences or Interpretations	Possible Cures/Strategies	Examples of Possible Wording for Effective Communications
4. Lack of Empathy/Understanding of Others	Poor teamwork/spirit Lack of cooperation Wasted time and resources	Widen your perceptions and awareness of those around you and the environment. Endeavor to be a team player. Large organizations, hospital units, workgroups, and families run best with a cooperative spirit among individuals. Conversations and regularly scheduled FACE to FACE meetings are a must for development of rapport, negotiating and problem-solving. If your group prefers email for all communication, ask for a scheduled face to face, prepare an agenda and send it out in advance.	It is critical to make eye contact and give undivided attention while the other person is talking. Do not take your phone to meetings unless you are expecting an urgent call. Acknowledge the other person's feelings. "I can see how tough this must be for you." "Based on looking around this room at all your faces, I can see the angst you are all feeling about this (patient, situation, issue)." "I know it has been hard on you to worry about scheduling issues all the time."

Table 5 (continued)

Possible Causes	Possible Consequences or Interpretations	Possible Cures/Strategies	Examples of Possible Wording for Effective Communications
5. Unresolved Emotional Issues (e.g., history of physical or emotional abuse)	Distorted perceptions of the world Misinterpretation of the motives and messages of others Distorted responses to the communication of others	Resolve your issues and do not focus on other peoples' issues; to do so takes time from looking at your own issues. Seek to clarify and resolve the issue, if you feel the other person misinterpreted what you said or meant and as a result, there is conflict or bad feelings. Always own your own words and actions.	"I think there has been a misunderstanding here; I would like to discuss/clarify/ clear this up." "I apologize if I was not clear; let me explain what I meant."
6. Poor Self-Image/ Self-Esteem	Perceived attacks Perceived threats Perceived losses Fear of others or situations	As above, in number 5. If you feel threatened or attacked, step back, remain calm, and provide feedback to the other person(s). Allow yourself to be honest with your feelings.	"I am feeling like there is quite a bit of emotion in the room right now." "Sounds like this issue gets people fired up."

Table 5 (continued)

Possible Causes	Possible Consequences or Interpretations	Possible Cures/Strategies	Examples of Possible Wording for Effective Communications
7. Poor Self-Image/ Negative Self-Talk	Contributes to low self-image and lack of respect from others.	As above, in number 6. Do not refer to yourself in negative terms, such as, "I'm a mess." Listen first, then respond. Ask for a specific example.	When receiving feedback that may be helpful for your development – you can listen first, then respond with, "What I hear you saying is that I can become impatient at times…." It may be helpful to ask for a specific example or incident of the behavior to enable you to have a fuller understanding of what may need to be changed. Try, "Can you provide an example of what you are referring to?"
8. Lack of Boundaries/ Inability to Set Limits	Can be caused by a history of abuse	As above, in number 6. Learn the difference between being a team player and being taken advantage of. Do not agree to fulfill obligations, tasks, assignments that you are not sufficiently competent to perform; or clearly qualified to do. Do not agree to do anything outside your scope of practice or clinical privileges. Know that it is ok to say NO. Know that it is ok to say YES and ask how to do it.	"I have not been trained to perform that task; I would be happy to observe you at this time and learn." "Please walk me through this policy, process, procedure…." "I will check with my supervisor and inform you what I find out."

Table 5 (continued)

Possible Causes	Possible Consequences or Interpretations	Possible Cures/Strategies	Examples of Possible Wording for Effective Communications
9. Lack of Insight	Blindness to your faults and flaws robs you of opportunity for personal growth	Be open to input from others. Ask for honest feedback. Be willing to take constructive criticism. Work to develop the insight of a mature adult. Own your mistakes, apologize when you are wrong, and take action to correct any damage that has been done. Resolve to learn from your mistakes and flaws and not to repeat the same behavior in the future. Request feedback from trusted individuals.	"I have been told I am impatient, do you agree with that observation?"
10. Physical or Mental Illness	Pain, depression, or anxiety can affect one's ability to focus, listen, and respond.	Take care of your health, no one else will do this or should do this for you. Request in simple terms the time you need to take care of yourself at work and at home.	"I am taking a nap/bath/break do not disturb me for one hour." "I need to take Friday morning off for a medical appointment."

Table 5 (continued)

Possible Causes	Possible Consequences or Interpretations	Possible Cures/Strategies	Examples of Possible Wording for Effective Communications
11. Hidden Agendas, Politics, Games, and Tests	Disdain and lack of trust for authority figures Secrets create disempowerment and dependency which can lead to increased stress, burnout, lack of creativity and motivation	Do not participate in gossip, rumors or back-stabbing. Demonstrate integrity in all that you do. Be honest. Own your own mistakes. Excuse yourself from or try to redirect the conversation if the discussion has turned from facts/problem solving to gossip or complaining.	"It seems we have strayed a bit from the original topic of the meeting…..can we get back to the agenda/problem at hand?" "I believe the item we were discussing was ….and …the following solution(s) have been offered…"
12. Lack of Clear, Plain Speech or Writing (e.g., acronyms, codes, slang, hashtags, accents, culture, apps, jargon)	Distancing strategy Power move You can appear uneducated	Speak and present yourself in a professional manner at all times. Never use slang or improper English in professional situations. If you lack communication skills for appropriate speech and/or writing, learn them. Do not use acronyms, abbreviations, or other short-hand languages unless everyone on the receiving end knows what they mean. If you do not know, ask for an explanation.	

Note. (Vertino, 2014) .

empathy, emotional issues, poor self-esteem/self-image, lack of boundaries or insight, illness, hidden agendas (Vertino, 2014). For a person to be successful in society, effective interpersonal communication is necessary to negotiate the challenges involved in all human interactions, particularly those on the job. The college experience is an opportunity to develop students into future leaders by providing them with situations that teach how best to handle a variety of situations and make them into effective communicators.

Virtual Simulation vs. Traditional Role Play -- Mursion®

An important part of training for several areas includes practice in one form or another. Typically, in a classroom setting, this takes the form of role play between classmates. One area of professional preparation that includes extensive practice is education. Since the tool used in this study was Mursion®, which was initially developed as a tool to train teachers, that is the lens used here to compare traditional role play to virtual simulation. One area of professional preparation that includes extensive practice is teaching. When it comes to practice teaching, role play is not a new phenomenon (Adams & Mabusela, 2014; Andersson, King, & Lalande, 2010; Cruickshank & Armaline, 1986; Gregory & Masters, 2012; Rector-Aranda & Raider-Roth, 2015; Rogers & Evans, 2007; Thiessen, 2000; Tillema & Veenman, 1987). Fortunately for the profession, the practice aspect of teaching did not stop there. In his article, Forzani discusses the trend toward "practice-based" teacher education which potentially extends placements for candidates in the schools but also opens the door for other types of "field experiences" (2014). The need for practice is not a new idea. There has been a need for more practical experience for quite a while now (Popkewitz, 1985). In an effort to allow for these practical experiences, in the state of North Carolina at least, the legislature mandated increased practicum experiences to

acquire a teaching license and directed the schools and colleges of education to provide them (Saffron, 2015).

As addressed above, practicing is essential, and as new mandates for how state or nationally licensed professions are established year after year, inevitably within those mandates is a requirement that candidates spend more time practicing. No one disputes the usefulness of a teacher candidate's training in the classroom with students and teachers. For the millennials, regardless of their field, who are not accustomed to communicating with people from other generations, particularly in a professional manner, it is vital that practice represents the contexts and persons with whom they must communicate (Smith & Nichols, 2015). The primary responsibility of higher education is to prepare the students to face this workplace, as diverse as it may be, in the best way possible.

Experiential learning is a process that helps learners gain knowledge, skill, and value from direct experience (Luckmann, 1996). It requires structured experiences that include reflection, discussion, and evaluation of those experiences, such as that provided through immersion simulators such as Mursion®. Reflection can focus on a variety of issues including the feeling associated with an event or the specific role the person is trying to fill (Caffarella & Barnett, 1994). Kolb's experiential learning cycle provides a compelling theoretical framework that works well with Mursion® (see Figure 1). Kolb's model shows that for learning to be most effective, it must provide four instructional components: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Petkus, Jr., 2000).

Mursion® is designed to provide participants the opportunity to immerse themselves in the learning event, rather than merely observe them. It is intended to be integrated directly with the learning that is taught in the classroom, and not meant as a separate, disjointed tool. The

scenarios that were used as part of this study represented true-to-life professional situations the students are likely to encounter on the job. During the simulation, the student had the opportunity to interact with an avatar representative of the people with whom they would communicate on the job, rather than the more typical role play with a peer representing that person. Avatars are "virtual humans [who] are able to connect with real people in powerful, meaningful, and complex ways" (Swartout et al., 2013, p. 13).

Role play has been found to be an effective way to practice real-world simulations and increase student involvement whether scripted or open-ended (Rudra, Jaeger, Aitken, Chang, & Helgheim, 2011). Role play can make the learning experience more accessible, meaningful and engaging, particularly, as Anderson (2013) points out in the article "Learning from Do-Overs: Repeated Practice in Elementary Teacher Education," the most significant limitation of providing teacher candidates with opportunities to practice is the lack of access to students (p. 9). Only those actively trying to find classroom placements for teacher candidates really understand how difficult it is to find schools and teachers who are willing to turn their students over to future teachers so they can be practiced on (Anderson, Labij, & Barr, 2013; Zeichner, 2010). The difficulty in finding placement locations was one of the struggles that inspired the development of TeachLivE™ (Hayes, Straub, Dieker, Hughes, & Hynes, 2013) and the adoption of its commercial iteration Mursion® by Eastern University examined in this study. Existing research on student perception and experience with this innovative teaching tool validates that Immersive Simulation Activities (ISAs) provide a practical, immersive educational experience whose unique benefits significantly enhance the teacher education experience while lessening the need for exposing live students to under-experienced educators (Bautista & Boone, 2015; Chini,

Straub, & Thomas, 2016; Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014; Judge, Bobzien, Maydosz, Gear, & Katsioloudis, 2013).

It is vital that candidates have an opportunity to get into the classroom, to learn how teaching and learning work in schools and what it is like to be around actual children, that is not disputed, what is also essential, and what Mursion® provides, is an opportunity for candidates to practice classroom skills and then reflect on them. Unlike in the 'live' classroom, it is difficult to erase the children and teacher's memory of what transpired and redo the teaching experience as a candidate would choose after reflection. "It is essential that teacher education programs provide candidates with the opportunity to practice and master new methods" (Anderson, Labij, & Barr, 2013). The purpose of Anderson's study was to find out the impact of repeated ISA practice on teaching behaviors of 138 elementary teacher candidates who taught the same lesson to small groups of 4th grade students four times in a row (Anderson et al., 2013; Zeichner, 2010). Several interesting facts were revealed through the candidates' reflection journals, observational transcripts, and teacher interviews. First, nearly all the candidates refined or changed their lesson after the second or third time.

Using virtual simulators to train doctors, pilots and soldiers is not new (Darling-Hammond, 2006; Feng & Cheng, 2009; Robb et al., 2013; Sinclair & Ferguson, 2009; Vankipuram et al., 2014); however, applying that type of technology to the field of education is virtually unheard of with one notable exception (Bogost, 2007; Buckridge & Taylor, 2014; Chini et al., 2016; Judge et al., 2013). In 1975, a game was created that required first-year high school teachers to make decisions that would affect people differently as part of the process for renewing their teaching contracts. For this game, teachers primarily responded to multiple choice questions. While not a true simulation, the game did demonstrate the complexities of education

(Bogost, 2007). This is what prompted researchers at UCF, who were already known as a leader in simulation technology, to incorporate virtual simulation in their teacher training programs. When UCF first began to develop and use virtual simulations, first developed at UCF the technology was used for teacher recruitment. One of the first studies done at UCF included 108 students from four local school districts in central Florida who participated in STEM summer camps (Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014). Dieker, Rodriguez, Lignugaris/Kraft, Hynes, and Hughes (2014) explained that the earlier iteration of TeachLivE™ called TeachME was used to recruit gifted students into teaching and STEM careers. For these STEM camp students, the technology that makes TeachLivE™ work, especially for those who are interested in technology, was more interesting than what they achieved through the simulated interactions themselves. The STEM camp students were provided with the opportunity to see the behind the scenes all aspects of "TeachME," the predecessor of what became TeachLivE™ at UCF, which later became commercially available as Mursion®. The purpose of Dieker's study was not to analyze the use of TeachME as a teacher preparation tool, but instead to explore how the technology aspect of the tool may be used to get students interested in a STEM career (Dieker, Grillo, & Ramlakan, 2001). Unlike through books and other typical classroom materials, TeachME gave the students opportunities to dive in and touch, see and feel the technology, which resulted in them developing a more profound interest and deeper involvement in learning. After the hands-on opportunities to learn through TeachME and other innovations, the students were presented with a range of STEM career opportunities (Dieker, Grillo, & Ramlakan, 2001).

Based on the results of a myriad studies focusing on this technological innovation – including annual international conference proceedings published on the TeachLivE™.org

website beginning in 2013 – mixed reality simulations provide an opportunity for teacher candidates to have realistic practice in a safe space before entering a real classroom (Bautista & Boone, 2015; Chini et al., 2016; Dieker, Hynes, Hughes, Hardin, & Becht, 2015; Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014; Hayes, Straub, Dieker, Hughes, & Hynes, 2013; Judge et al., 2013; Medow & Lassman, 2013). The simulations incorporate enough reality that the candidates cannot know what will happen, and this uncertainty is necessary for learning to occur (Shulman, 2005, p. 52). The technology requires candidates to actively participate in scenarios in mixed reality environments to simulate the learning environment. Initially developed for educator training, preservice and current teachers could practice teaching, develop instructional or classroom management skills, deliver content, and try out new techniques, as individual skills or in combination (Eisenreich & Harshman, 2014). The simulations give candidates an opportunity to practice techniques repeatedly without wasting classroom instructional time or negatively affecting children (Dieker, Hynes, Hughes, & Smith, 2008; Hayes, Straub, Dieker, Hughes, & Hynes, 2013). The literature and the data from this study reinforced that candidates benefited from repeat sessions in the Mursion® simulator by becoming more familiar with the technology, the class, and, especially important for candidates, on how to teach (Bautista & Boone, 2015; Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014; Straub et al., 2014).

This practice is similar to the way in which generations of medical students have been trained which allowed doctors to practice medical techniques, and which is now undergoing a revolution (Bogam, 2014; van Meurs, Good, & Lampotang, 1997; Yashar, Clarke, Wang, Coates, & Uijtdehaage, 2014). Early educational simulations developed to prepare teacher candidates were developed using the experience of veteran teachers, professional literature, and

direct requests from the candidates (Dotger, 2015). The more opportunities candidates have to practice teaching skills, the more quickly they are able to learn and internalize those skills; thereby allowing candidates to focus on the class, topics, and assignments rather than having to think about how to teach (Shulman, 2005).

TeachME was later renamed at UCF to TeachLivE™ and was used not only for K-12 teacher preparation but, in one study, was used to train 14 learning assistants (LA) to teach physics classes. Since the assistants were chosen because of their knowledge of the subject and not their teaching ability or interest, it was necessary to teach them how to teach. The LA's used the simulator to practice pedagogy skills including introducing content, leading a discussion, asking and answering questions. At the end of the study, more than half of the LAs reported that the avatars had realistic personalities and that it did not take long for the simulation to feel natural (Chini et al., 2016).

In March 2012, UCF was awarded a 3-year $1.5 million grant by the Bill & Melinda Gates Foundation to support TeachLivE™ (Dieker, Hughes, & Hynes, Gates Foundation Final Report, 2016; UCF Foundation, 2012). By 2014, UCF had 23 universities using TeachLivE™ (Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014). By the end of the 3-year grant, TeachLivE™ had been created, refined and commercialized as Mursion® to over 80 colleges of education and several school districts impacting teacher preparation and professional development (Dieker, Hughes, & Hynes, Gates Foundation Final Report, 2016).

Since 2012, the iterations of Mursion® have contributed extensive research findings for the field of educator preparation (Bautista & Boone, 2015; Chini et al., 2016; Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014; Hayes et al., 2013; Judge et al., 2013; Storey & Cox, 2015; Whitten & Wallace, 2014). Specifically, in the field of Educational Leadership,

preliminary findings were presented at the Annual TeachLivE™ Conference in 2014 regarding practice and coaching using TeachLivE™ for students in a Master of Education program. The students reported finding that a virtually simulated conference with a parent and with a teacher were helpful in improving their communication (Buckridge & Taylor, 2014). The final results of the study were presented at the 2016 conference. More qualitative data was analyzed specifically the comments in reflection documents. The results revealed that over half of the subjects found the experience beneficial, which further supported the original quantitative findings (Buckridge, 2016).

Current research indicates that a significant benefit of using a virtual simulator to practice teaching is that, since no real children are involved no harm can be done. This is particularly critical when students receiving Special Education services are involved. Children identified with autism require individual interventions which "teachers may not be adequately prepared to adequately deliver" (Garland, Vasquez, & Pearl, 2012). In Garland's study, the sessions enabled four teacher candidates to interact individually with a single avatar who presented with characteristics of a student with autism, while being coached. All four of the candidates demonstrated improvement in their performance – from 32% to 85%, after engaging in the simulation with coaching. Giving candidates this opportunity to work on individual skills before entering a classroom can make the transition more comfortable and the limited amount of time a candidate does get in the field can be much more rewarding and useful, particularly for candidates mastering complex skills that must be applied with diverse students receiving special education services. An area with which many teacher candidates struggle is classroom management (Dieker, Hynes, Hughes, & Smith, 2008; Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014). When one takes the difficulties that candidates have engaging students

in learning and addressing challenging behaviors, in any licensure program added to the additional responsibilities that come from teaching diverse students including those receiving special education services, providing live practice only makes sense. Classes serving diverse students, particularly those with identified special needs and receiving special education services, by their very nature, include a population with different strengths and needs particularly a wide range of academic needs (Billingsley & Scheuermann, 2014). Practice is needed to master not only the knowledge and skills to meet individual students' needs, but also the overall management of a classroom full of students (Garland, Holden, & Garland, 2016).

As a field, education professionals respect the lives of children, so it is crucial that teachers are given the best tools possible to accomplish the task of educating them ethically and effectively. It is also clear that once teachers make it into the classroom, it is too late for them to be still practicing and hoping for the best. There are other careers that only have one chance to get it right and individuals preparing for these careers must have the opportunity to practice through simulations before they are expected to perform in real life high stakes situations. Before the invention of TeachLivE™, this practice was not possible for educators on an individual basis with any true sense of realism (Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014). Now that the technology exists, it needs to be made available to as many pre-professionals across as many preparation programs as possible. Throughout the literature, much discussion surrounds the benefits using Mursion® provides for teacher candidates, K-12 educators, and more recently, others. At this time, however, the majority of the literature reports research results in the field of education. There is little available in other fields, particularly from the perspective of the students themselves, how they view the technology, or how it enhances their readiness for their chosen professions.

No one bats an eye when someone mentions Microsoft Word or PowerPoint or looks in a classroom and sees a whiteboard instead of a chalkboard. Simulated environments and virtual environments are slowly becoming more commonplace and accepted in today's world (Dieker, Straub, Hughes, Hynes, & Hardin, 2014), not only in educator training but in an increasing variety of additional fields. Research has shown that simulation is a useful tool to allow those in education and a few other fields to practice skills realistically. Before the invention of Mursion®, simulation was not available for educators with any true sense of realism. Now that the technology exists, it needs to be made available across multiple curricula beyond education to allow students to learn practical, interpersonal skills before they graduate. Throughout the literature, the benefits of Mursion® for educators is reported, but additional research must be conducted to determine how useful this tool may be outside of education for students to learn and practice interpersonal communication skills. The overarching research question for this study is to begin to determine whether Mursion® would be an effective solution to improve communication skills in other undergraduate and graduate programs?

Summary

Several factors can influence a student's ability to succeed once they graduate college. Of particular importance is their interpersonal communication skills. A review of the literature related to active learning, communication skills, and the virtual simulation technology, Mursion® provides insight into how these related variables can be integrated to provide students with the best possible footing for success once they have graduated and are ready to join the workforce.

CHAPTER 3: METHODOLOGY

This chapter begins with a review of the study's purpose and research questions. The chapter then provides a description and rationale for the research methodology, sampling, data collection methods, and data analysis procedures. Also, techniques for ensuring the reliability and validity of the research are provided, and limitations are discussed.

Review of the Purpose and Research Questions

The purpose of this study was to identify the impact on students' beliefs about their interpersonal communication skills after using Mursion® to experience situations they are likely to encounter in their fields. The study analyzed the student's self-reported beliefs about their interpersonal communication skills before and after their Mursion® experience(s). The study also examined the reflections of students on the Mursion® experience itself and whether they perceived the experience as preparing them for some of the potential demands of their careers as they understand them. The groups were participating in the study were stratified by the number of times the participants engaged in a Mursion® session. The research questions that guided this study were:

1. How do students' self-perceived views of their ability to communicate change after they have participated in at least one Mursion® activity that was embedded in the course curriculum?
2. How does the amount of exposure to Mursion® affect student interpersonal communication skills?
3. How do students' self-perceived views of their ability to communicate change after they have participated in at least one Mursion® activity not embedded in the course curriculum?

Design of the Study

This study sought to identify the impact Mursion® experiences had on the university students' perception of their interpersonal communication skills. The study analyzed the student's self-reported beliefs about their interpersonal communication skills before and after their Mursion® experience(s). The study also examined the students' reflections on the Mursion® experience itself and whether they believed it prepared them for their careers or at least the specific situation they experienced within Mursion®.

Sampling Procedure

Purposeful sampling procedure was utilized in this study. Instructors outside of the College of Education who were planning to use Mursion® in a class between the Spring 2018 and Fall 2018 were asked if their class could participate in this study. Although the sessions were part of a course requirement, the individual students within the class were given the option to participate in the research. As the study got underway, the research was able to utilize data participants from an American Athletic Conference (AAC) grant to study Mursion® use with college athletes.

Since this group was part of a different study, they had additional questions to answer that were not part of this study, but all the parts of this study were able to be integrated. These participants also signed a consent form for both their original study and this one. Criteria to participate in this study were: (1) must be 18 years or older, (2) must be attending the university conducting the study, and (3) must be an undergraduate or graduate student pursuing a degree.

The study participants represented diverse fields, and the focus of the study concerned participants self-perceived communication skills and their view of the Mursion® intervention. Three primary groups were analyzed. Two of the groups consisted of athletes, one who

participated in no Mursion® simulation sessions and one who participated in three simulation sessions. On Table 6, the athletes make up the primary members of Group A and Group D. The decisions for the athletes were made by the Primary Investigator for the grant. Group A only completed the pre-survey toward the beginning of the semester and the post- survey approximately 4 weeks later. Group A included 40 freshman athletes which was made up of 9 males and 31 females in 14 majors. Their diversity breakdown included 8 black or African-Americans, 2 Hispanic or Latino, 29 whites, and 1 other (see Table 7). For group D, the researcher influenced the number of sessions that would be done and gave some guidance on scenario development. Logistics would not allow the athletes to do the three sessions in immediate succession, which was beneficial for collecting data between sessions. Group D included 49 athletes which was made up of 19 males and 20 females in 21 majors. Their diversity breakdown included 1 Asian/Pacific Islander, 9 black or African-Americans, 1 Hispanic or Latino, 25 whites, and 3 other (see Table 7). This group included 20 freshmen, 5 sophomores, 4 juniors, and 10 seniors. The third group were students who participated in a single Mursion® simulation as part of a course they were enrolled in as part of their major, these students make up Group B. For this group, the instructor of record for the applicable course had complete control over the application of Mursion® in their course. The instructor determined the treatment's focus, how long each treatment lasted, and in how many sessions the participant would be involved. Before a class' first Mursion® session, the research would meet each instructor at least twice to introduce the technology and finalize the scenario(s). Group B included 29 students which was made up of 3 males, 24 females, and 2 who did not disclose in 3 majors. Their diversity breakdown included 9 black or African-Americans, 15 whites, 2 unknown and 3 did not disclose (see Table 7). The participants were broken down into primary

Table 6

Study Design

Study Step	Group A	Group B	Group C	Group D
Pre-ICCS	X	X	X	X
Mursion® Session 1		X	X	X
Debriefing Questions Interview		X	X	X
Interpersonal Communication Short Survey			X	X
Mursion® Session 2			X	X
Interpersonal Communication Short Survey				X
Mursion® Session 3				X
Post-ICCS	X	X	X	X
Final Feedback Survey		X	X	X

Note. "X" shows included steps.

Table 7

Study Participants

Characteristics	Group A	Group B	Group D
Gender	Males: 9 Females: 31	Male: 3 Female: 24 Did not disclose: 2	Males: 19 Females: 20
Major	Biology: 4 Business: 6 Communications: 3 Criminal Justice: 1 Education: 1 Exercise Physiology/ Science: 10 Finance: 1 Marketing: 1 Nursing: 2 Nutrition: 1 Psychology: 1 Sports Studies: 1 Undecided: 6 Did not disclose: 2	Audiology: 6 Social Work: 21 Did not Disclose: 2	Accounting: 1 Biochemistry: 1 Biology: 1 Business: 5 Communications: 3 Construction Management: 1 Engineering: 2 Exercise Physiology: 1 Finance: 3 Geography: 1 Marketing: 1 Nursing: 1 Operations and Supply Chain Management: 1 Physical Education: 1 Psychology: 2 Public Health: 4 Speech and Hearing Sciences: 1 Sports Studies: 3 Urban Planning: 1 Undecided: 4
Race	Black or African American: 8 Hispanic or Latino: 2 White: 29 Other: 1	Black or African American: 9 White: 15 Unknown/Not Reported: 2 Did not disclose: 3	Asian/Pacific Islander: 1 Black or African American: 9 Hispanic or Latino: 1 White: 25 Other: 3

Table 7 (continued)

Characteristics	Group A	Group B	Group D
Year	Freshman: 40	Undergraduate Student: 5 Graduate Student: 22 Doctoral Student: 7	Freshman: 20 Sophomore: 5 Junior: 4 Senior: 10
Degree		BA: 1 BS: 4 MA: 5 MS: 17 EdD: 1 AuD: 6	

treatment groups based on the number of times the participants used Mursion®. The participants were comprised of undergraduate and graduate students from various Colleges and Schools from across the university. There were not enough students with collected data to create a meaningful Group C.

Method

Mursion® first came to Eastern University in Spring 2016. It was clear to me in my role as Mursion@ECU coordinator that data collected when students used Mursion® could be invaluable for future research the faculty would want to do. With that purpose in mind, I worked with the Institutional Review Board (IRB) to have a generalized study approved for future Mursion® research (see Appendix A). I then asked and received approval to use data gathered under that study for this research (see Appendix B).

All participants completed the Consent form (see Appendix C) and were able to ask any questions and were given the option to opt out of the study before completing any study activity. Initially the forms were given on paper and the surveys were given through Qualtrics, but it was found that since no identifiers could be given in Qualtrics and the goal was to see a change over time, most of the data gathered in this way could not be used because the subsequent surveys could not be matched up. I discovered and learned to use Redcap, a new survey software. Redcap data is housed on a server that is internal to the university, so identifiers, including FERPA data are allowed. In addition, when a survey is taken in Redcap multiple times by the same participant, the submissions are attributed to the same person, making it the perfect software for this purpose. Due to the initial setback with Qualtrics, at least 54 submissions could not be used because they could not be matched to produce any relevant data.

Type of Research Design

This mixed-methodology study provided a more complete understanding than a single methodological approach would afford (Creswell, 2014). Specifically, this study used a concurrent embedded design, which is a mixed method approach that wraps quantitative data in qualitative data. The use of this design allowed for both a subjective analysis of the participant's view of any change in their interpersonal communication skills and Mursion® experience as well as an objective view of the participant's actual interpersonal communication skill use during their interaction in Mursion®. A qualitative multi-group study comprised of different program areas across the university was conducted. A multi-group study approach was chosen because it would allow the researcher to focus on the intervention and develop a detailed accounting of what was occurring (Creswell, 2014). Each of the large groups consisted of smaller groups, sorted by the number of simulations in which they participated which were compared to other groups with the same number of simulation sessions. In this approach, the ICCS survey was used to measure self-perception of participants' interpersonal communication skills (Rubin & Martin, 1994). The analysis compared results at the individual student and group level. Students' perceptions of the Mursion® experience was explored through participant interviews, observations, questionnaires, and other documents (Bartholomew & Brown, 2012). Prior to any Mursion® exposure, each participant completed a consent form, demographic information, and a pre-ICCS survey. Then immediately after the first interaction, every participant was individually interviewed by a graduate assistant about the experience. If they were to experience additional Mursion® sessions, they completed the ICCS short survey after each experience and a Post-ICCS survey after they had completed all of their Mursion® experiences and discussions. In addition,

once all Mursion® time was completed, each participant also completed a final feedback survey with open-ended questions about the entire experience.

Instrumentation

Table 6 shows how each of the instruments in the study was implemented with each group. The criteria for grouping the students was the number of times the participants engaged in a Mursion® simulation session: Group A – Zero Mursion® sessions, Group B – One Mursion® session, Group C – Two Mursion® sessions, and Group D – Three Mursion® sessions.

Interpersonal Communication Competence Scale (ICCS). For this study, all students were asked to complete the Interpersonal Communication Competence Scale short form (Rubin & Martin, 1994) before their first session (Pre-ICCS) and again at the conclusion of their Mursion® treatment(s) (Post-ICCS), see Appendix E. The ICCS was developed by Rubin and Martin to incorporate the most commonly identified dimensions in interpersonal communication (Spitzberg & Adams, 2007). The short version of the scale was used which has 10 items. It is rated on a 5-point range (Rubin & Martin, 1994). In Appendix E the questions on the short version are noted by the use of an asterisk (*). Responses of the ICCS were reported in a Likert style format. Participants were asked to respond with one of five possible responses to reflect their communication with others: Almost Always, Often, Sometimes, Seldom and Almost Never. Both forms measure the following skills: self-disclosure, empathy, social relaxation, assertiveness, altercentrism, interaction management, expressiveness, supportiveness, immediacy, and environmental control (Spitzberg & Adams, 2007) by asking self-reflective questions such as “When I’ve been wrong, I confront the person who wronged me” (Rubin & Martin, 1994). Since there were three groups, based on the number of sessions they had in Mursion®, they also completed the ICCS scale between each Mursion® experience as well, which

allowed for better comparison among all groups. This tool has been validated with 247 students in a communication course and was positively rated to both cognitive flexibility and communication flexibility (Rubin & Martin, 1994).

Debriefing questions. Upon reviewing other reflective scales, the researcher devised interview questions entitled "Debriefing Questions" using a reflective practice model to facilitate reflection on the participant's experience in the simulations (see Appendix G) based on reflections done in service experiences (CalPolyPomona, 2015). These are the questions that seemed the most relevant, and the approach was chosen to allow the participants to arrive at their own conclusions to the experience without being influenced by the interviewer. Participants in groups B, C, and D answered these reflective questions into a recorder in a debriefing session after using Mursion® once. After their initial Mursion® experience, each student left the Mursion® lab and went to another room where the student was provided a paper with five debrief questions and audio recorded their answers in the presence of a graduate assistant who served as an interview facilitator. Using a reflective practice model through these interview questions was essential to fully involve the participant in the understanding of their experience. These interviews served as a bridge between the study and the personal experience, which is highly individual, so a reflection on the personal experience becomes a potential learning experience for the participant (Cox, 2005). The questions were intended to determine how the experience impacted the student participants.

Final feedback survey. The Final Feedback survey, also developed by the researcher as an outcome of a pilot study briefly addressed below, continued with questions developed using the reflective practice model. The survey was administered after the participants in Groups B, C, and D finished their required Mursion® session(s) and any class discussion associated with their

Mursion® experience(s) or scenario, asking some final questions about their experiences (see Appendix H). The questions in this survey came about after a discussion the researcher had with a class during the Fall semester of 2017 at the end of their Mursion® experience. The information gained in that discussion seemed very relevant, and I wanted to expand on the findings from that small sample to this study. Mursion® was a new technology and a new experience for the students. The purpose of the questions was to bring forth the awareness of the participants; however, each expressed opinions on how they believed the experience would benefit others (Høffding & Martiny, 2016, p. 560). I did not want to continue doing this as a group discussion because I wanted to make sure I was able to gain additional information from each participant after their entire Mursion® experience had ended. The responses from the participant on the feedback survey were noted and compared to the debrief questions. Once this information was gathered, the results of the participants were compared to others in the same group and then across groups. Going into the study, the researcher had an idea of how the study would go based on previous experiences and observations in the Mursion® lab; however, she felt it essential to allow the participants to shape the actual themes that would be exposed. The final results of the study are data-driven and in no way reflective of the views of the researcher (Jewell, 2007). The purpose behind these questions was to explore how the participants viewed their Mursion® experience after having time to reflect and discuss. The questions are different from the debriefing questions, but there was a comparison between the answers in the previous study and the answers in the Final Feedback.

Data Collection Procedures

The first meeting with the faculty member was typically a demonstration to show them Mursion®, to tell them about it, and discuss with them how it might be used in their program to benefit their students. At that meeting, if they were interested, a discussion would take place to determine the scenario they would be using. Typically, it involved giving them a Scenario Builder Template and discussing how to go about creating a new scenario using the template. The researcher would then advise them to use the Mursion® Scheduler to schedule both the time and date when they wanted their students to come in for a Mursion® session and also, at least a week prior, a Mursion® test session to complete the development of the scenario. Some came to the test session with a plan ready to implement, and some came with only ideas, but at that session, the instructor, the researcher, and the interactor would work to create a working scenario. Once the scenario was ready and practiced, the live session could be implemented. The researcher worked to get as even a split of groups as was possible. Before the first treatment, the participants completed the short form of the Interpersonal Communication Competence Scale (ICCS) to get a baseline of how they viewed themselves in the areas of Empathy, Social Relaxation, Assertiveness, Interaction Management, Altercentrism, Expressiveness, Supportiveness, Immediacy, and Environmental Control (Rubin & Martin, 1994).

Experience for athletes. For the purposes of this research, the athletes (Group D) completed the pre-survey, before entering the Mursion® lab, but only the data from the ICCS short-form and questions about their comfort talking to different members of the coaching staff were used from that instrument. After their first Mursion® session, each participant answered debriefing interview questions, asked by a graduate assistant, which allowed the participant to

consider the experience immediately afterward while it was still fresh for them. The responses were recorded, transcribed, and coded.

Once the interview concluded, participants repeated the ICCS short-form, and again between each of their three Mursion® experiences as well, which allowed for better comparison based on individual experiences and overall experience. Each athlete participated in three virtual interactions with avatars who represented authority figures on topics such as playing time, stress, academics, life after sports, and financial issues

Upon conclusion of their Mursion® sessions, after the student-athletes had had an opportunity to reflect on their experiences, they were given a final feedback survey. It gave the athletes an opportunity to answer more questions in their own space after their three Mursion® experiences had concluded to determine what the overall experience was like for them. The survey was given in written form with some multiple choice and some short-answer questions (see Appendix H). The responses of this survey were also recorded and coded.

The athletes (Group A) who did not participate in Mursion® were given the pre-survey within the first few weeks of the semester and were given no type of treatment of any kind related to the study. About four weeks later, all participants, whether they had been through Mursion® or not, were then given the post-survey.

Experience for non-athletes. Group B is a composite of students from several different classes in programs such as social work, audiology, counseling, and business. The exact experience for each class varied. Each class used a scenario that was designed specifically to cover the objectives for their course. For example, the social work students' scenario allowed the students to conduct a session with a client at a substance abuse center to find out why the person had come and get them to commit to returning for another session. Once in the lab, participants

were usually given a brief introduction to the Mursion® environment by either their instructor or the lab facilitator and were able to ask any questions before beginning their assigned scenario. Depending on the instructor's preference, some of the participants were alone in the room with only a Mursion® facilitator and their instructor, while others participated with the entire class present. After each participant finished their session, they left the room and debriefed by answering the Debriefing Questions (see Appendix G) and returned to their class. The responses were recorded, transcribed, and coded. Participants repeated the ICCS short form at the end of their participation in the study. Since there were four groups (those that experienced Mursion® once, twice, three times and never), they also completed the ICCS short form between each Mursion® experience as well, to allow for comparison among all groups based on individual experiences and overall experience. Once the class concluded all discussion and reflection of their Mursion® experience(s), the students were asked to complete the Final Feedback survey (Appendix H) to determine their opinion of the overall experience.

Researcher as the Instrument

Creswell (2014) stated that one of the common characteristics of qualitative research is the researcher serves as the "key instrument" for collecting data (p. 234). He also said that since qualitative research is interpretive, researchers "explicitly identify reflexively their biases, values, and personal background. . . that may shape their interpretations formed during the study" (Creswell, 2014, p. 237). This openness and reflexivity strengthen the validity of the study (Creswell, 2014). With this in mind, I would like to note, that I have worked to start the Mursion® lab at Eastern University, and currently serve as its lead coordinator. To minimize any potential bias in the interview process, I used a graduate assistant to conduct the debrief

interviews. If one was not available when needed, I found another faculty, staff member, or student to conduct the interviews, so I could in no way influence a participant's answers.

Summary

In summary, the components of the interaction were: an introduction of Mursion® by the faculty member to the students, student interaction with Mursion® avatars, feedback by faculty and peers, reflection – all parts are possible but used at the faculty member's discretion. When looking at the groups who participated, there were several different cross-sections which could be analyzed and compared beyond the number of Mursion® sessions. These included students in graduate and undergraduate programs, as well as differences in sex, age, race, and other demographics. In addition, there were several different program areas, especially when looking at the athletes who participated from various sports, majors, and classes. I have run the data in many of these ways in order to most thoroughly answer my research questions. Table 8 breaks down the research questions into the instrumentation used to analyze them (data sources) and how each source was analyzed.

Table 8

Research Questions, Sources of Data, Analysis, and Variables

Research question	Data Sources	Data Analysis
1. How do students' self-perceived views of their ability to communicate change after they have interacted with Mursion®?	Pre ICCS (Pre-survey)	Descriptive statistics, ANOVA tests, Independent t-tests, paired means tests.
	Mursion® Session 1 Survey	
	Mursion® Session 2 Survey	
	Post-ICCS (Post Survey)	
	Debriefing Questions Interview	Code and categorize responses.
	Final Feedback Survey	Coding and Categorize responses along with descriptive statistics.
2. How does the amount of exposure to Mursion® affect student interpersonal communication skills?	Pre ICCS (Pre-survey)	Descriptive statistics, ANOVA tests, Independent t-tests, paired means tests.
	Mursion® Session 1 Survey	
	Mursion® Session 2 Survey	
	Post-ICCS (Post Survey)	
3. After using Mursion®, does the student-athlete's perception of their ability to communicate change?	Pre ICCS (Pre-survey)	Descriptive statistics, ANOVA tests, Independent t-tests, paired means tests.
	Mursion® Session 1 Survey	
	Mursion® Session 2 Survey	
	Post-ICCS (Post Survey)	
	Debriefing Questions Interview	Code and categorize responses.
	Final Feedback Survey	Coding and Categorize responses along with descriptive statistics.

CHAPTER 4: DATA ANALYSIS

Initial codes were identified in the pilot data by reading through the interview transcripts and manually looking for common themes. Some that emerged were ‘practice,’ ‘realistic,’ ‘weird,’ ‘interesting,’ ‘positive experience,’ ‘helpful,’ ‘use more details,’ and ‘act more natural,’ which were imported into NVIVO. Each of the interview transcripts and answers from the open-ended question on the Final Feedback survey from the actual study data were imported into NVivo, then potential themes and outliers were identified and found to be consistent with the pilot data. Once the themes were identified in the debrief interviews, the nodes were created to identify them quickly. Additional nodes were also created to specifically align with each of the research questions. Next, final feedback surveys were analyzed to identify overlapping, emergent, and outlier themes. The final feedback surveys and interviews were coded for themes that were similar across groups.

In addition to the feedback surveys, the ICCS data was analyzed using SPSS 25. An ANOVA test followed by a Tukey HSD test was utilized to determine significance levels of mean differences for each category. An ANOVA test is typically used when there is one data set, but it is divided up into different groups. The results of this survey were compared for each student from before Mursion® Session 1 through the last session with additional surveys between intermittent sessions. The results were also compared between and across groups and across demographic differences.

The data was analyzed quantitatively within group and across groups by performing analysis using SPSS 25 on the ICCS data in the pre and post surveys, and, for group D, between sessions. There were three groups, Group A, B and D included in this analysis. Figures 4, 5, and 7 show these results in graph form with each figure representing one group and are discussed in

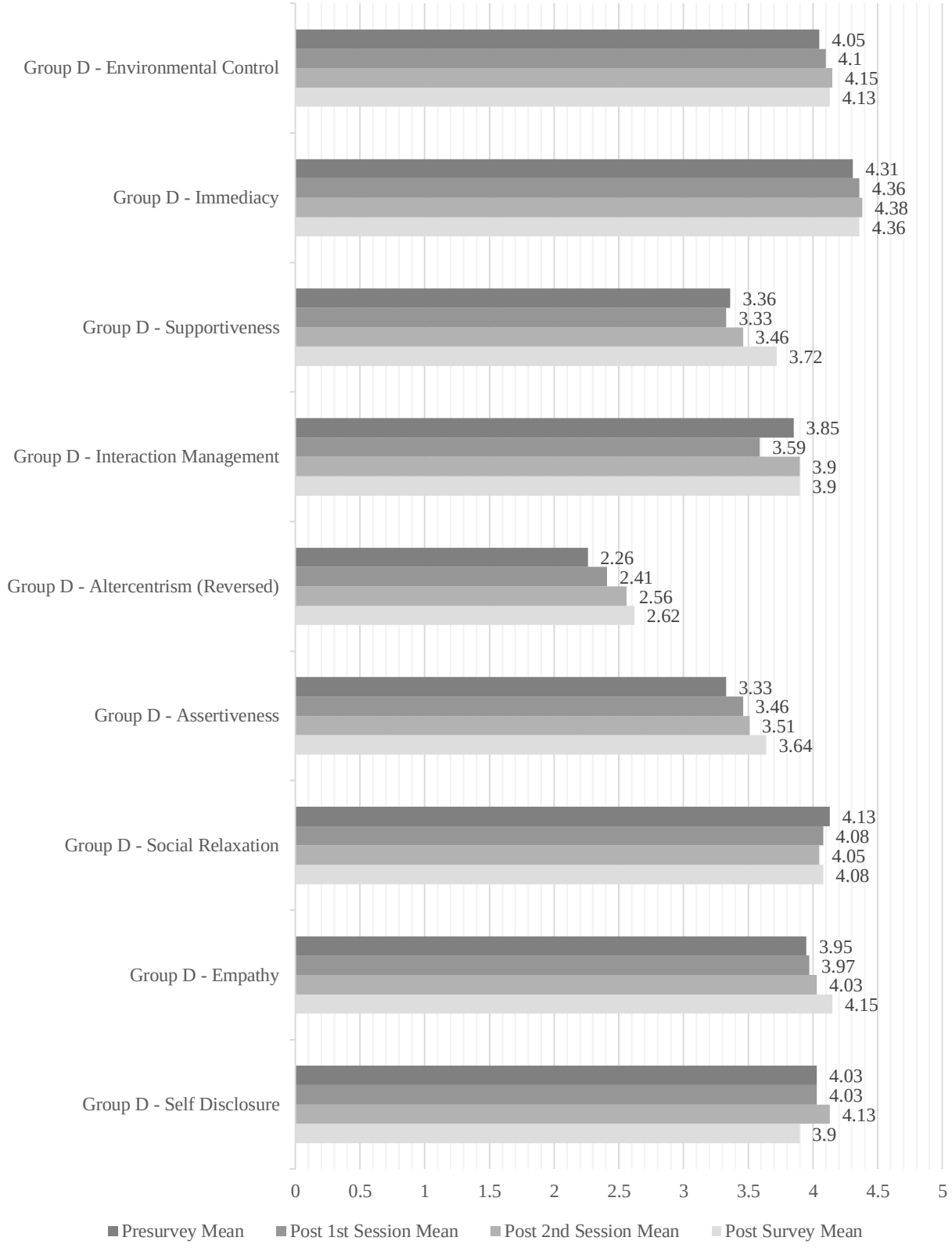


Figure 4. Group D Means by survey question focus.

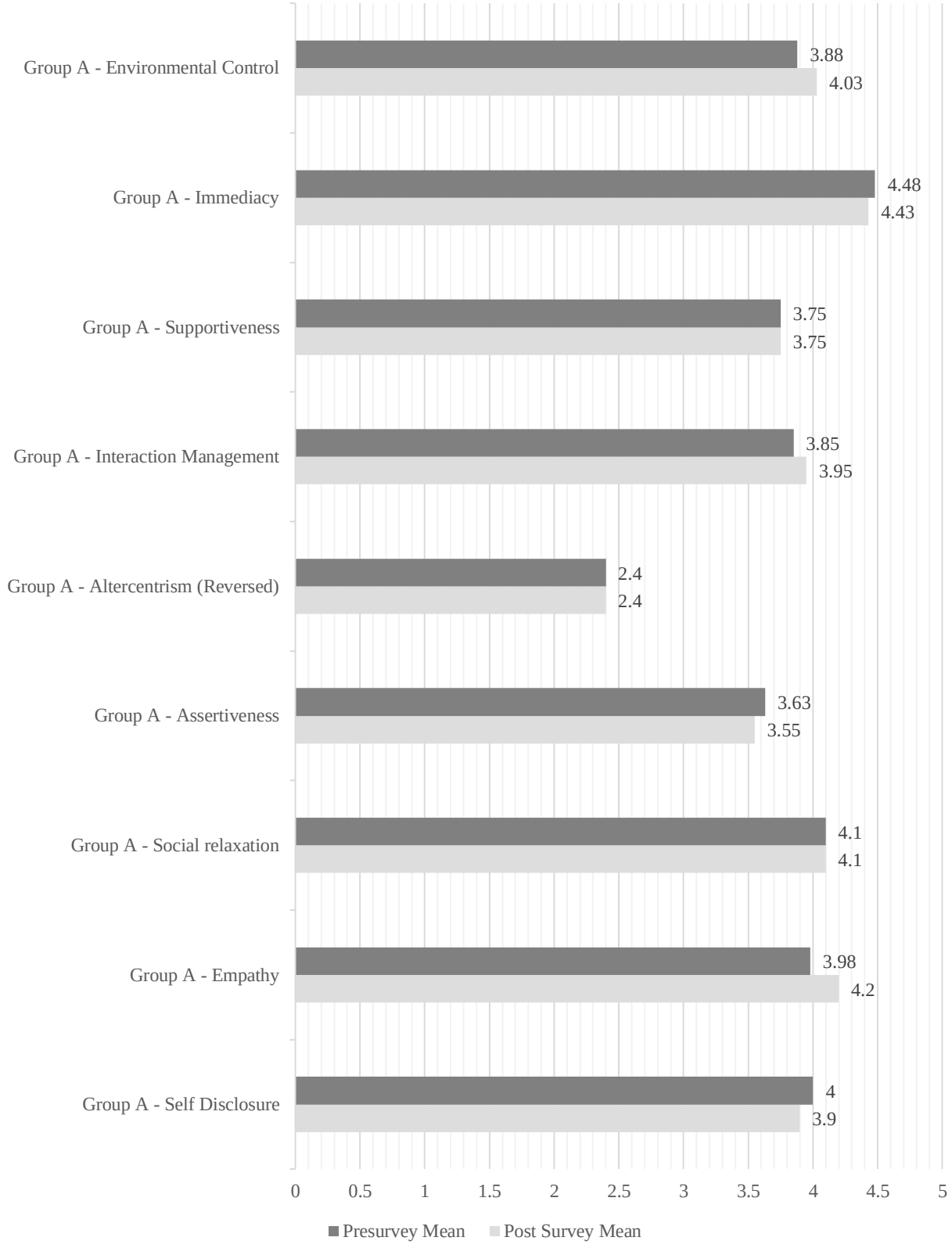


Figure 5. Group A Means by survey question focus.

detail in the following sections. The results of the ICCS survey showed no significance when analyzed as a whole, but some specific areas did show significance within a group.

Athlete Results Analyzed (Groups D and A)

Group D participated in three Mursion® sessions, each with a different topic, with only enough time to do interviews and surveys in between those sessions. So, while they were able to practice multiple times, they received no feedback on their performance during any of the sessions. Additionally, the participants in Group D volunteered to engage in Mursion® sessions independent of any course or program requirement.

Group A functioned as a control group and only participated in this study by completing the pre and post surveys. They did not experience Mursion or any kind of communication coaching. Any change seen with this group would be caused by external factors not related to this study. This group consisted of all freshmen who were part of a COAD class, which reflects the majority of Group D.

The following Quantitative Results and Qualitative Results sections discuss the findings primarily for Group D. Group A only participated in quantitative surveys, so results for this group are only found in the Quantitative Results section.

Quantitative Results

When comparing the pre- and post-session data collected from the ICCS for Group D, three questions show significant changes in their averages, as shown in Figure 4. Also shown in Figure 4 are the results of the ICCS surveys taken between each session to show any small change that may have occurred from one session to the next. An ANOVA test followed by a Tukey HSD test was utilized to determine significance levels of mean differences for each group on their pre and post surveys. The most significant change from pre to post was in the question

designed to measure supportiveness, “My communication is usually descriptive, not evaluative.” Participants started with an average of 3.36, but after the sessions, the average changed to 3.72. This resulted in a change of 0.359 and a p-value of 0.011. The next question that showed significance measured altercentrism, which is interest in others, “My conversations are pretty one-sided.” Participants started with an average of 2.26, but after the sessions, the average changed to 2.62. This resulted in a change of 0.359 and a p-value of 0.025. The last question that showed significance measured assertiveness, “When I've been wronged, I confront the person who wronged me.” Participants started with an average of 3.33, but after the sessions, the average changed to 3.64. This resulted in a change of 0.308 and a p-value of 0.026.

Group A never saw nor were they ever introduced to Mursion® so any change see could only be accounted for by experiences they had during their first year at college. There was no significant change in any of the categories by this group, as shown in Figure 5. As a reflection of Group D, looking at these questions in Group A, for supportiveness and altercentrism there was no change. For assertiveness, the change in pre and post values was 0.075 which resulted in a p-value of 0.584. The most substantial change for this group related to empathy, “I can put myself in others’ shoes.” Participants started with an average of 3.975, but in the post survey, the average changed to 4.2. This change in average answer was 0.225, resulting in a p-value of 0.011.

Qualitative Results

According to the interview and final feedback data, the athletes in the study did feel like Mursion® was helpful in practicing communication skills. While some did report that they felt weird and awkward at first speaking to a screen instead of a real person, the majority commented on how life-like and realistic the avatars they spoke with were.

> "I thought it was very very lifelike. This is surprising. It felt like I was talking to like a real person. . . [It] actually- helped me think about new approaches that I wouldn't have thought about necessarily just going on to [talk to] a teacher cold turkey. I expect to have those types of conversations in the future so [I'm] pretty glad that I came here to give it a test run. It just really prepares me for what I have to deal with in the future." – Male, freshman, computer sciences major, swimming/diving.

When asked about their level of satisfaction with their experience in Mursion®, the mean response for Group D participants was 6.17, demonstrating they were moderately satisfied overall, although Figure 6 shows that none reported being dissatisfied. When asked if the participants would each come to the lab on their own time to practice communication skills, 67% said yes while 33% answered no. In response to the question assessing the likelihood of these participants recommending use of Mursion® to a friend or colleague, the mean response across participants in Group D on a 10-point scale was 7.2 with a mode of 10.

Appendix I provides information on what the athletes comprising Group D liked most and least about their Mursion® experience. As shown in Appendix I, the majority of respondents indicated that they enjoyed the experience and would be willing to do it again. Those that were less interested indicated that they were uncomfortable either with the technology or with the situation.

Non-Athlete Results Analyzed (Group B)

Group B consisted primarily of students who were part of either the Doctor of Audiology program or the Master of Social Work program, although one reported to be earning a Bachelor of Science in Social Work. Unlike Group D, all of the Group B members participated in

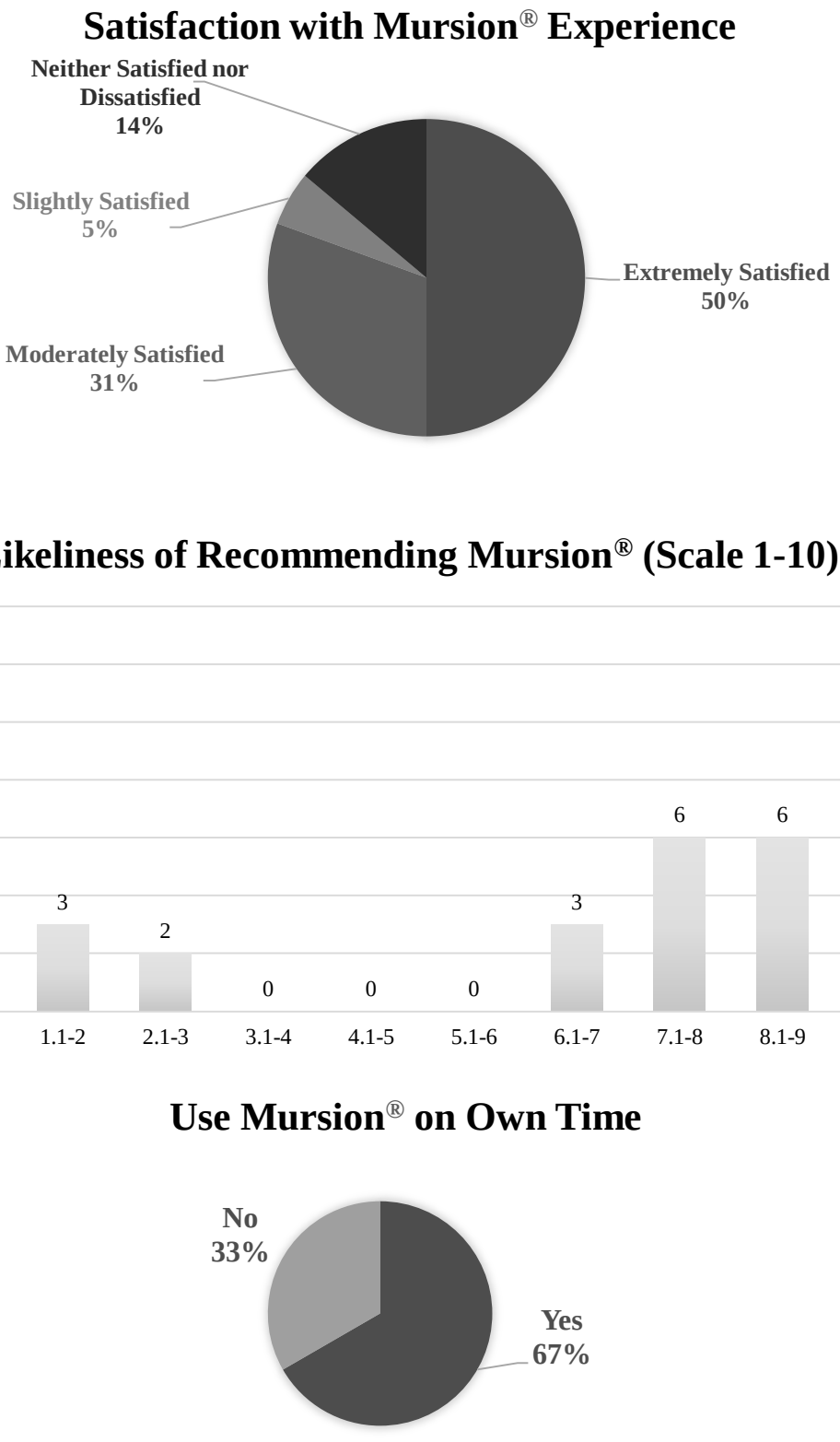


Figure 6. Group D results from Final Feedback Survey regarding satisfaction.

Mursion® as part of a course. Unlike Group D, Group B participated in one Mursion® session and received extensive feedback on their experience from the professor and their peers in the class, typically both immediately after their session and at a later time through review of a video capture of their session. Additional qualitative data was secured when the professor provided the reflections completed as an assignment by those involved in the Social Work program after a second session that was not recorded because the students had completed the study before participating in this additional Mursion® session. The qualitative data from these reflections is discussed in the qualitative section below.

Quantitative Results

The ICCS results for Group B was a mix of the results found in Groups A and D. The most significant result for group B was in the measure of supportiveness: "My communication is usually descriptive, not evaluative." As shown in Figure 7, Group B started with a mean score of 3.41. After completing the Mursion® sessions, the average mean score? on this variable increased to 3.69, a change of 0.28 ($p<0.04$). The other question that showed significance changes before and after completing Mursion® sessions was empathy, with a pre-session mean score of 4.34 and a post-session mean score of 4.55. a change of 0.21 ($p<0.04$).

Qualitative Results

As in evident in Table 9 and Figures 8 and 9, the survey data and the interview data indicated that the participants found the Mursion® experience to be beneficial and/or enjoyable. When asked how satisfied or dissatisfied they were with their experience in Mursion®, 43% of Group B reported moderately satisfied, 29% slightly satisfied, 17% neither satisfied nor

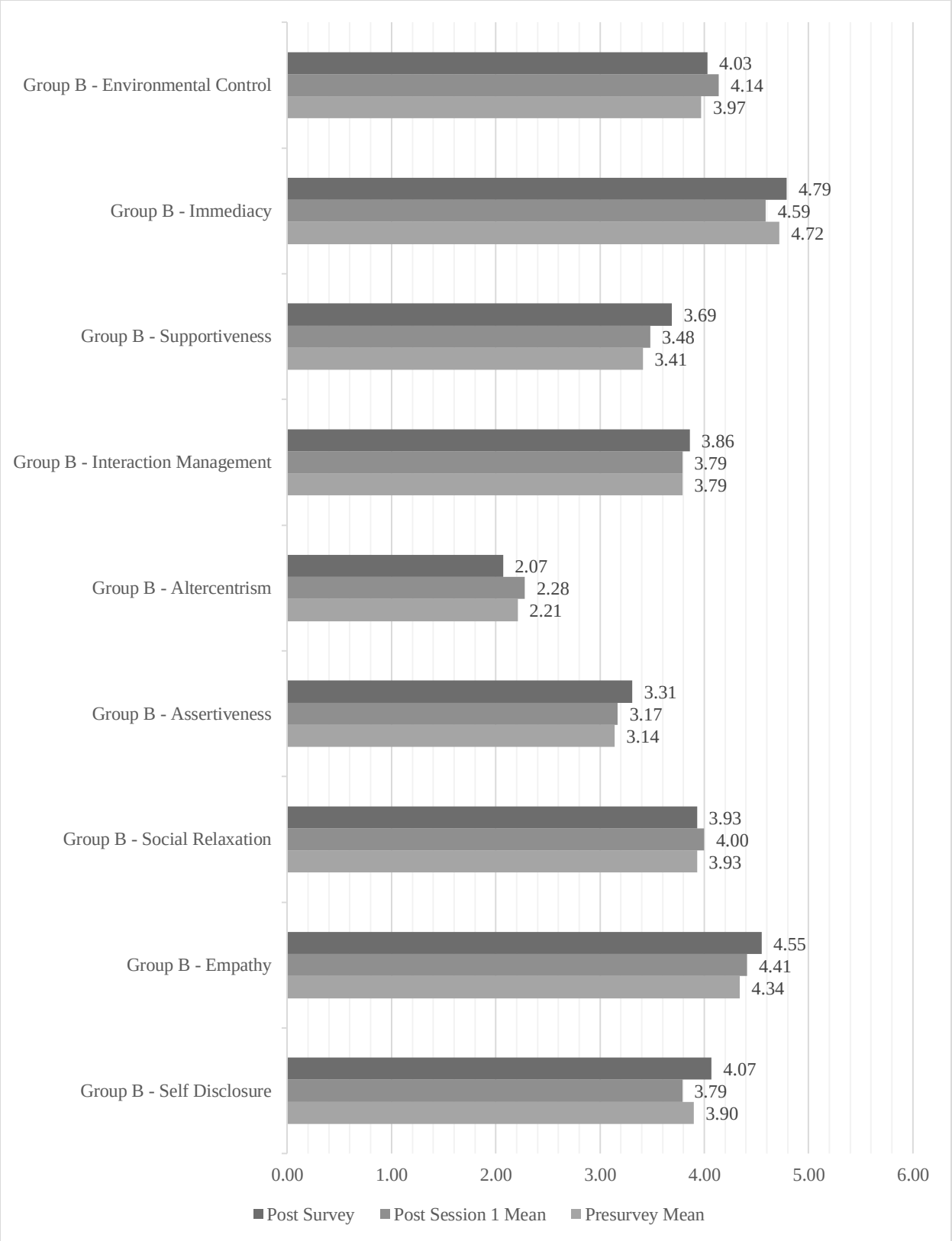


Figure 7. Group B Means by survey question focus.

Table 9

Means and Standard Deviation for Each Survey Divided by Group

	Group A		Group B		Group D	
	Mean	SD	Mean	SD	Mean	SD
Self-disclosure Pre-survey	4.02	0.785	3.90	0.86	4.03	0.743
Self-disclosure Mid-survey			3.79	0.819	4.03	0.707
Self-disclosure Post survey	3.90	0.934	4.07	0.923	3.90	0.788
Empathy Pre-survey	3.96	0.651	4.34	0.614	3.95	0.857
Empathy Mid-survey			4.41	0.628	3.97	0.707
Empathy Post survey	4.13	0.672	4.55	0.572	4.15	0.844
Social Relaxation Pre-survey	4.00	0.851	3.93	0.799	4.13	0.767
Social Relaxation Mid-survey			4.00	0.926	4.08	0.807
Social Relaxation Post survey	3.96	0.898	3.93	0.923	4.08	0.623
Assertiveness Pre-survey	3.60	0.893	3.14	1.026	3.33	0.982
Assertiveness Mid-survey			3.17	0.848	3.46	0.790
Assertiveness Post survey	3.56	0.848	3.31	0.891	3.64	0.932
Altercentrism Pre-survey	2.40	0.736	2.21	0.902	2.26	0.715
Altercentrism Mid-survey			2.28	0.751	2.41	0.549
Altercentrism Post survey	2.44	0.769	2.07	0.923	2.62	0.935
Interaction management Pre-survey	3.79	0.683	3.79	0.559	3.85	0.709
Interaction management Mid-survey			3.79	0.559	3.59	0.677
Interaction management Post survey	3.83	0.781	3.86	0.581	3.90	0.788
Supportive Pre-survey	3.71	0.683	3.41	0.907	3.36	0.668

Table 9 (continued)

	Group A		Group B		Group D	
	Mean	SD	Mean	SD	Mean	SD
Supportive Mid-survey			3.48	0.785	3.33	0.577
Supportive Post survey	3.69	0.689	3.69	0.660	3.72	0.686
Immediacy Pre-survey	4.50	0.648	4.72	0.455	4.31	0.766
Immediacy Mid-survey			4.59	0.568	4.36	0.628
Immediacy Post survey	4.44	0.712	4.79	0.491	4.36	0.778
Environmental control Pre-survey	3.73	0.917	3.97	0.731	4.05	0.793
Environmental control Mid-survey			4.14	0.639	4.10	0.598
Environmental control Post survey	3.96	0.824	4.03	0.778	4.13	0.656

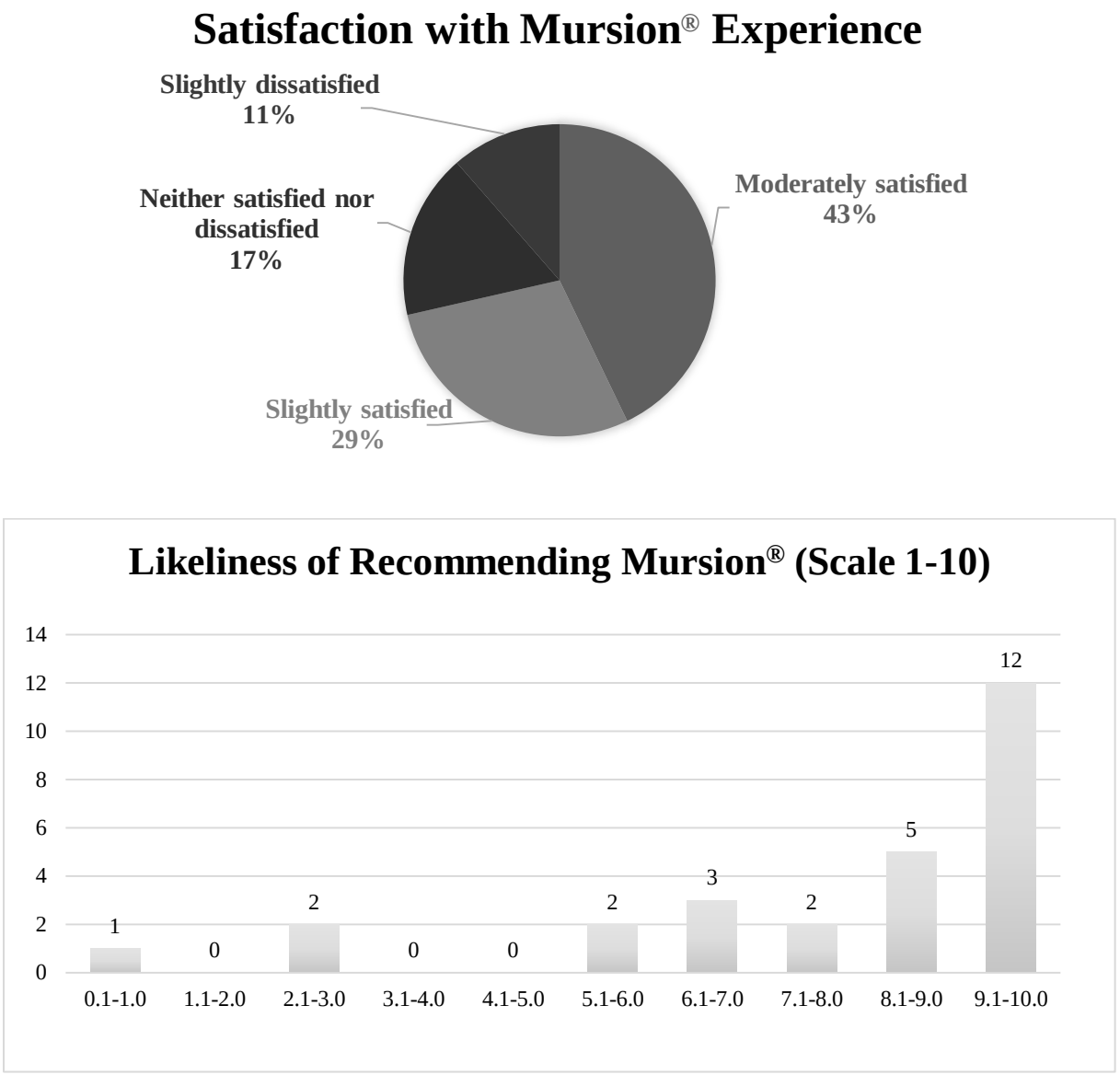


Figure 8. Group B results from Final Feedback Survey regarding satisfaction.

Figure 9. Word Cloud of most common terms in Group B's feedback, interviews, and reflection papers (provided by instructor).

dissatisfied, and 11% reported being slightly dissatisfied (see Figure 8). When the interviews were analyzed in NVivo, 40 instances of a positive experience were identified, and only 1 was identified as negative. The negative response indicated that the participant did not find the Mursion® simulation realistic.

> I like to interact with the patients. I like to see their facial expressions and I like to be able to interact with them more basically and have an understanding from a nonverbal standpoint of where they're coming from and I feel like what the Mursion experience it's a little bit difficult to see their facial expressions because it was just a blank stare for most of the time. – Male, doctoral student, audiology major

This is understandable since the avatars have not been designed to show emotion other than through voice inflection and the words themselves. The avatars do display some body language and facial expressions, but the avatars are not able to truly emote. Analysis of the responses to the Final Feedback survey (see Appendix I), reveals one similar comment regarding the inability to show emotion. In contrast, the majority of the interviewees' responses showed excitement about the experience. For example, one female Social Work student said:

> I was speaking to my classmates and letting them know that I think we are very fortunate that we have been able to be involved in this opportunity. I mean, I think it's absolutely awesome, and I'm- I'm happy to say as a student at ____ that my university has a simulation lab. State of the art! I think it's awesome! - *Female, graduate student, social work major*

Students also reported that they appreciated the ability to practice realistic situations and that the avatars responded in the way real clients would. There were some technical glitches

reported that caused some dissatisfaction, but all reported that the use of Mursion® helped them improve their interviewing skills and made them better prepared for when they faced real clients. The primary program areas for this group were Social Work and Counseling, so when looking at the common words used in their feedback, client is used the most, but coming in close behind it were "like" and "experiences" (see Figure 9).

Further Quantitative Analysis

After looking at the initial quantitative data, it was necessary to start comparing the groups to each other in order to determine what factors, if any, made a difference with these participants (see Table 9). Because only Groups B and D completed surveys after Session 1, independent t-tests were used to further compare the data on these surveys. This analysis resulted in a significant difference between the two groups only in empathy, showing that those in Group B reported a higher comfort level in empathy than those in Group D, $t(66)=2.658$, $p=0.01$. This same result was also found when comparing athletes to nonathletes on the post Session 1. Also, for the question that measured immediacy, "People truly believe that I care about them," nonathletes (Group B) also reported a higher level of comfort in immediacy compared to athletes, whose pre- and post-survey question read "My friends truly believe that I care about them," both in the pre-survey ($t(94.901)= 2.629$, $p=0.01$) and the Post survey ($t(90.986)= 2.715$, $p<0.01$).

The next sets that were compared were Group A (athletes who did not experience Mursion®) to Group D (athletes who experienced Mursion® three times in succession). An independent t-test was used to compare how these two groups of athletes viewed their ability to communicate after zero and three sessions. There was no significant difference in means found in any of the surveys for any of the topics except for supportiveness. On the Pre-survey, those in

Group A reported high comfort levels in supportiveness compared to those in Group D ($t(77)= 1.028$, $p=0.011$).

Further analysis was completed by using a paired samples test. This resulted in significance being found in four of the nine areas measured. Between the pre-survey and Post survey, comfort level in empathy rose 0.215 on the average answer ($p<0.01$), in altercentrism rose 0.308 on the average answer ($p<0.02$). Interestingly, participants' comfort level with interaction management, "My conversations are characterized by smooth shifts from one topic to the next," dropped 0.256 ($p<0.05$) between the pre-survey and the post Session 1 survey on the average answer and rose 0.308 ($p<0.01$) between the post Session 1 survey and the post Session 2 survey.

An ANOVA test followed by a Tukey HSD test was utilized to determine significance levels of mean differences for each group on their pre and Post surveys. An independent t-test was used for further comparison on the post Session 1 survey. Group B scored higher on their comfort level in empathy compared to Group D ($t(66)=2.658$, $p=0.01$)on the post Session 1 survey, and Group D scored higher than B in immediacy ($p<0.03$).

A final ANOVA test was run followed by a Tukey HSD test to determine the significance levels of mean differences based on the participant's year. Graduate students scored higher on comfort levels in empathy ($p<0.01$) and immediacy ($p<0.03$) compared to Seniors on the pre-survey. On the post Session 1 survey, Freshman ($p<0.02$) and Graduate Students ($p<0.03$) both scored higher than Seniors in immediacy. For altercentrism on the Post survey, graduate students scored lower than freshman ($p=0.05$).

When looking at the results of the Final Feedback survey for Groups B and D, Figures 6 and 8, both showed very similar satisfaction and interest in Mursion®. Group D reported a

slightly higher level of satisfaction, but on average those in Group B would be more likely to recommend to a friend. The number of those who would come to the lab to practice was almost exactly the same between the two groups. Group D had two additional people, and those two were split. For Group D, 24 indicated that they would return and 12 indicated that they would not, while for Group B, 23 indicated that they would return and 11 indicated that they would not.

Analyzing Research Questions

The study was guided by three research questions that were answered with data collected from the ICCS short survey (taken multiple times), Debriefing Questions Interview, and the Final Feedback Survey. The analysis of this data was presented in the previous section including Figures 4, 5, and 6 and Appendix I and are discussed as it pertains to each research question in the following sections of this chapter.

Research Question One

1. *How do students' self-perceived views of their ability to communicate change after they have participated in at least one Mursion® activity that was embedded in the course curriculum?*

The groups who participated in this study did so for very different reasons. Group B participated as part of a class assignment to intentionally improve on skills they had been developing in the classroom. Group D volunteered to be part of a study as student-athletes without any context to relate the experience to and were assigned scenarios that they may or may not have related to. The experiences of the groups thereby were also quite different. Group B typically participated in the room with their professor and classmates and was able to receive instant feedback during and after their interactions and were able to watch the footage afterward. In contrast, Group D participated outside of any classes they were taking in the room with the

facilitator they did not know and sometimes an additional researcher or two. They received little to no feedback about their interaction and were not able to view their footage afterward. Even with those distinctions being made, an overwhelming amount of the qualitative data resulting from interviews and final feedback surveys shows that 67.5% of those in groups B and D would choose to use Mursion® on their own time to practice. As shown in Figure 10, the majority from both groups, 24 out of 50 chose 10 on a scale of 0-10 as to how likely they would be to recommend Mursion®. When Group B reflected on their experience the majority believed the experience was much like what they will experience or have experienced in the field and that it was good practice to prepare for situations they will be faced with (see Appendix J). One even went so far in an interview as to say:

> I thought this was a great experience. I haven't really had a one-on-one interaction like that so that was a good chance for me to practice what I'm gonna be doing and I'm glad it was virtual and not a real client, so I actually liked it. It was a good good chance for me to test my skills. . . . I believe I gained experience ultimately from this assignment it really helped me test my abilities because you never know what a client is going to say and that's exactly what this did. So I believe I gained a little experience with one on one. I liked this assignment and I hope they continue it." – *Female, graduate student, social work major*

It can be concluded that after using Mursion® the majority of students report benefiting from their experience and feel more comfortable in the situation they faced in the simulation.

Research Question Two

How does the amount of exposure to Mursion® affect student interpersonal communication skills?

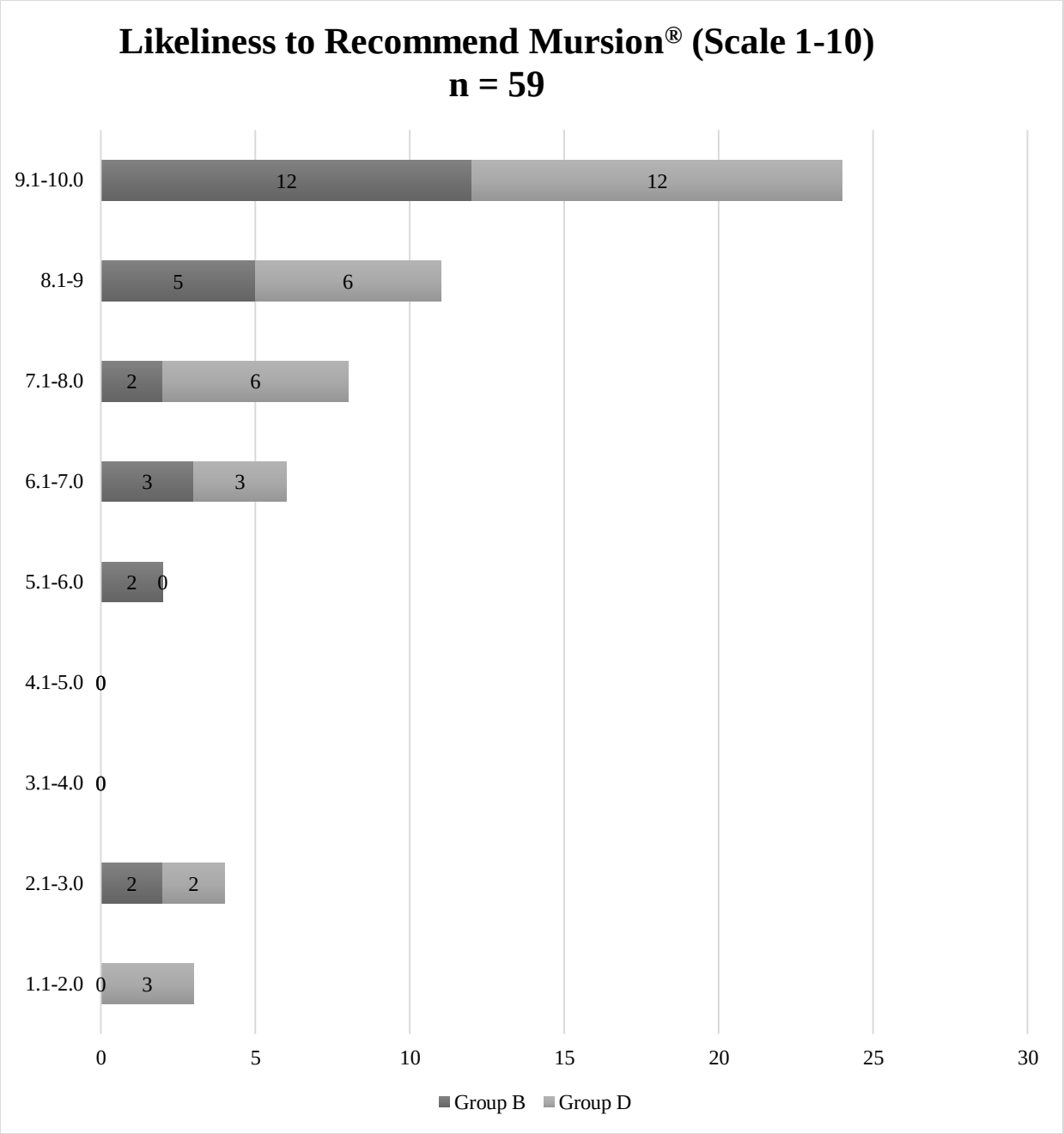
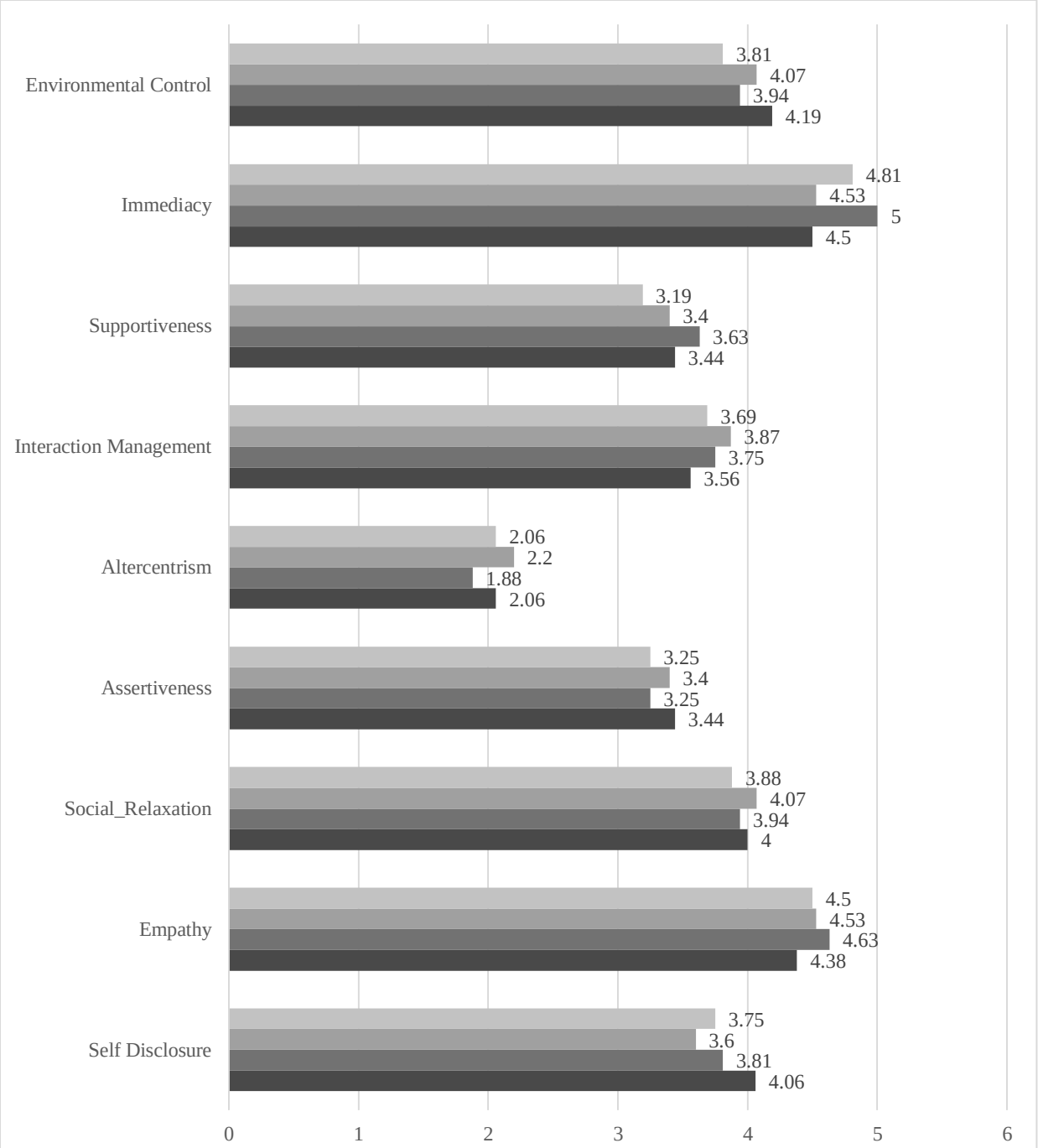


Figure 10. Likeliness of participants to recommend Mursion® to others.

The intention of this study was to be able to study groups who distinctly had one, two or three exposures primarily in a classroom setting. The end result of this study was a group with no exposure, one exposure and three exposures. Some of the members in Group B who completed the study after one exposure did have a second exposure and were able to complete the ICCS form after the later exposure, causing a small Group C (n=16) to form out of Group B. The time between Group C's Session 1 and Session 2 was typically four months. Figure 11 shows the results of the ICCS survey before any sessions, after Session 1, after all class discussion was completed, and after the Session 2 months later. The results showed an increase in five and no change in one of the nine categories. The professor of Group B's class furnished the "Mursion Lab Reflection" papers the students did as a requirement for his class. The primary theme of these papers compared their Session 1 to Session 2. Most reported improvements from their first experience and almost all reported they felt more comfortable the second time. Most of the students in this class had already been in classes together previously, which helped with the concern many voiced previously about doing their Mursion® session in front of the class. One student expressed:

> Returning to the Murison Lab this fall was initially very anxiety provoking due to having not done so well this summer. As I was sitting waiting for my turn I felt even more nervous than I did the initial time because I wanted to be successful with my client and had learned from my previous experience that I will not always be successful. I found the overall experience of the simulation both times quite interesting and helpful. The first time most difficult part was knowing everyone in the room was watching you. However, this time I didn't even really notice anyone was in the room once I started talking to the client. . . . After completing the simulation there were still some areas I feel I could work



	Self Disclosure	Empathy	Social_Relaxation	Assertiveness	Altercentrism	Interaction Management	Supportiveness	Immediacy	Environmental Control
Presurvey	3.75	4.5	3.88	3.25	2.06	3.69	3.19	4.81	3.81
Session 1	3.6	4.53	4.07	3.4	2.2	3.87	3.4	4.53	4.07
Session 2	3.81	4.63	3.94	3.25	1.88	3.75	3.63	5	3.94
Post Survey	4.06	4.38	4	3.44	2.06	3.56	3.44	4.5	4.19

Figure 11. Group C Means by survey question focus.

on such as the ending and being more patient. . . . Overall, I am grateful for the second experience because it helped me recognize the areas I need to continue to work on and the areas that I have improved on. More importantly though it allowed me to relate the information we have learned during both classes into practice. Learning through experience has always benefited more than just learning and having nothing to relate the information to. The simulation allowed me to understand the concepts and how they are applicable to what I will be doing in a clinical setting. Although I was nervous during the process I would rather be nervous while working with a simulated client as opposed to a real client. Getting the nervousness out while still in the learning process affords me the ability to be more comfortable when working with live clients. It also allows me the ability to reflect on areas I will continue to improve and build upon. – *Female, graduate student, social work major*

It can be concluded that multiple Mursion® sessions allow the participants to become more comfortable and therefore they are able to focus more on the objectives of their session. It can also be concluded that as more practice is provided in a structured, curriculum related session, skills are improved.

Research Question Three

1. *How do students' self-perceived views of their ability to communicate change after they have participated in at least one Mursion® activity that was embedded in the course curriculum?*

As mentioned earlier, the athletes in Group D participated outside of any of their classes and participated in three Mursion® sessions on topics that were randomly assigned to them. Some of the topics were more generally relatable than others. This disconnect was evident in the

initial interview if the athlete was unable to imagine themselves in the situation provided. For those who were able to connect with the topics, comments that mentioned communication were much more positive even after only one session, for example:

> I think I've gained a lot from this experience so far. It's been really interesting, and I think it's helping me learn how to communicate with my coach and the administrators better, and once again it's really realistic so it's gonna be really applicable to what we do – *Female, sophomore, public health major*

As mentioned previously, the athletes were not provided feedback on any of their sessions nor were they able to view their session afterward, so their sense of success or benefit was based solely on their personal reflection. After completing three sessions and given some time to reflect, an example of a response by an athlete specifically regarding communication was:

> I liked being able to have conversations virtually in different types of situations, in all of the situations they were able to help me come up with a solution to the different problems. Also, it showed me how to effectively communicate with my professor." – *Male, freshman, business major*

Reviewing Appendix I, the majority of the comments mentioned improving communication skills, so it can be concluded that athletes did believe their communication skills did benefit from this experience.

Overall, while the ICCS showed only limited significant change, participants did report, through interviews and survey data, benefit for their communication skills and more confidence going into situations similar to what they role played after participating in virtual role play activities. Multiple interactions were beneficial but were most beneficial when coupled with

coaching and/or feedback. 84% reported some level of satisfaction with their Mursion® experience and over two-thirds reported they would elect to use this tool in their own time to practice.

CHAPTER 5: DISCUSSION

This chapter contains a summary of the study and the research findings presented in Chapter 4 as related to each of the research questions, and a discussion of the implications of practice, limitations, and recommendations for future research. The chapter concludes with a summary statement about the research study. The purpose of this chapter was to make the connection between the data collected and preparation of college students for future careers in various programs and how leaders can use this preliminary information to begin implementation in their own programs to produce candidates with the communication skills valued by employers.

Summary of the Study

Interpersonal communication skills are high on the list of what employers are looking for when choosing a candidate for virtually any position and will continue to stay that way for the foreseeable future (Rainie & Anderson, 2017). Rainie and Anderson's report also warns that there is little confidence that the current K-16 education programs will be able to make the necessary adjustments by 2026. One such adjustment will be the need to carve out the time required to teach interpersonal skills en masse or at all. While the quantitative data was not significant, the study was a success. Students did not self-report a significant change from one session to the next on the ICCS; however, when talking and writing about their Mursion® experience, the majority reported ways that it benefited them either immediately or would be beneficial once they made it to the field, even after only one session. The study was conducted at Eastern University in the state of North Carolina. The problem that was studied focused on how students' communication skills can be developed through virtual role play activities to better prepare them for the workplace. The purpose of the study was to identify the impact of using Mursion® simulations that echo situations that university students are likely to encounter in their

fields of practice and the students' self-perceived communication skills. The study focused on programs outside of K-12 teacher preparation since most of the published research to date on the effectiveness of TeachLivE™ of Mursion® has been in this area.

The study encapsulated the perceptions of university students from various curricular areas through the following research questions.

1. How do students' self-perceived views of their ability to communicate change after they have interacted with Mursion®?
2. How does the amount of exposure to Mursion® affect student interpersonal communication skills?
3. After using Mursion®, does the student-athlete's perception of their ability to communicate change?

These questions were analyzed via a mixed methods design. Participants' responses to up to four ICCS surveys were analyzed: a presurvey, a post-survey and an additional survey after each Mursion® session. In addition, after a participant's first Mursion® session, a debrief interview was also conducted, which was transcribed and analyzed qualitatively. Once all Mursion® sessions were completed by a participant, a final feedback survey was issued. Both quantitative and qualitative methodology was used to analyze this survey.

Discussion of the Findings

Research Question One

1. How do students' self-perceived views of their ability to communicate change after they have participated in at least one Mursion® activity that was embedded in the course curriculum?

Research question one was answered with descriptive statistics to determine the perceived value of their Mursion® experience in developing communication skills through the ICCS survey (Pre, Interim and Post). Coding and categorizing responses to the Debriefing Interview and Final Feedback Survey were also used to more effectively capture the students' perceptions of how the experience affected their ability to communicate (see Table 8).

The ICCS survey did not provide statistical evidence to support an overall significant change after students interacted with Mursion®, though the most significant change by Group B and D was shown in their levels of supportiveness. Group B also showed a significant change in their level of empathy. According to the qualitative data provided in the final feedback survey, the majority of students who participated as part of a class believed their ability to communicate in the focus area of their session improved. These results indicate that the ICCS survey was not the proper tool to measure this change. The Conversational Skills Rating Scale (CSRS) developed by Spitzberg (1993) may be a better option in future research since it can be used as a self-assessment and as an observer-assessment (Appendix K).

Research Question Two

How does the amount of exposure to Mursion® affect student interpersonal communication skills?

Research question two was answered with descriptive statistics to determine the change in the ICCS scores between multiple Mursion® sessions and to also compare the responses of those who participated in multiple sessions to those who participated in only one session. A student reflection assignment provided by a faculty member was also analyzed.

Previous research by Dieker, Rodriguez, Lignugaris/Kraft, Hynes, and Hughes (2014) suggests that multiple Mursion® sessions were the most beneficial, but it was found that the data

from this study shows that while multiple sessions were helpful, relevance and feedback played a much more significant role. Group D, who had three sessions saw no significantly higher benefit than those in Group B who only experienced one session; however, those in Group B reported their sessions were directly relatable, while many in Group D had difficulty because they could not relate to at least one of the scenarios they were randomly assigned. Those in Group B had the benefit of feedback from their instructor, peers and often self-reflection of the video, giving the opportunity to learn from more than just the actual interaction. Group D did not receive feedback in any form and did not have an opportunity to watch the video of their sessions. Group C, who experienced a second Mursion® session reported the additional time in Mursion® was very beneficial to them because they were much more comfortable the second time. From their reflections, they also seemed appreciative of being able to have a second opportunity to "try again." The participants in Group C were in a Social Work class, so a lesson they learned from participating in an additional session was how clients may differ, and how to respond to different situations. One student reported:

> Going into the lab I felt much more relaxed compared to summer session. I felt better prepared to use motivational interviewing to direct the client into agreeing to terms I felt could be beneficial. While watching others completes their session I was able to provide beneficial tactics to proceed through the lab. Similar to last semester it noticed that when you aren't the individual in the therapist seat it's easier to think of responses however when the client can see your nonverbal responses it forces you to navigate the session on the edge of your seat. – *Male, graduate student, social work major*

The CSRS can be used by the participant for self-reflection and by an observer watching the live Mursion® session or videos. It also provides questions that are more aligned with an

active learning activity. The videos from this study can be analyzed using the Conversational Skills Rating Scale (CSRS) Observer Rating of Conversant Form which measures four primary areas: altercentrism, composure, expressiveness, and interaction management (Spitzberg & Adams, 2007). The CSRS aligns nicely with the objectives of the ICCS, which participants took as a self-assessment (see Appendix G). The CSRS was chosen because, as the students are engaged in preparing for many disciplines, the CSRS "related in the predicted direction, and generally with validity coefficients of reasonable size, to a wide variety of variables, across a wide variety of contexts and populations" (Spitzberg & Adams, 2007). The scenarios developed for each course including the virtual simulation being studied were used to achieve inter-rater reliability. Although the CSRS was designed to be used during live interactions, but because this study captures the virtual simulations on video, it can be used to analyze a random sample of videos from each group. The use of this scale would for an objective, quantitative measure to compare the videos. For validity, The Conversational Skills Rating Scale guidelines (Spitzberg & Adams, 2007) should be used to score the videos. Therefore, to get a fuller picture, the CSRS could be used as an observation tool to continue to answer this question in the future by analyzing the videos of single students going through multiple instances of Mursion® as well as by the participant to measure self-perceived change before and after their sessions.

Research Question Three

1. *How do students' self-perceived views of their ability to communicate change after they have participated in at least one Mursion® activity that was embedded in the course curriculum?*

Research question three focused only on Groups D, who participated outside of course curriculum and Group A, which was used as a comparative group which did not use Mursion®. It

was answered with descriptive statistics to find any change in the ICCS scores between the pre and post surveys. Coding and categorizing responses of the debriefing interview and final feedback survey was also used, similarly to question one, to more effectively capture the athletes' perceptions of how the experience affected their perception of their ability to communicate (see Table 8).

It was found that as with the entire set of participants, the athletes did not show significant change when comparing the pre-ICCS survey to the post, though the athletes in Group D did show a significant change in one-third of the categories: supportiveness, altercentrism, and assertiveness. Athletes in Group A, who did not experience Mursion®, did not see a significant change in any of those categories but did see a significant change in empathy over the same time period. These results show that the ICCS survey did not provide conclusive results that coincided with the results found in the interviews and final feedback survey. After their first experience, when asked what, if anything, they gained from the experience, 22 of the athletes reported gaining communication skills. One said:

> "Yes. I feel more comfortable addressing issues and with more practice, I think I could be very strong in my communication skills." –*Female, freshman, undecided major*

Not only did participants report an increase in their communication skills, many also reported an increase in their confidence levels. For example, when asked what he would take away from his Mursion® experience in the Final Feedback scale, one male biochemistry major said, "I will take away confidence in my ability to effectively handle stressful conversations about difficult subjects."

Implications

According to the Society for Human Resource Management nine in 10 employers report being ready to accept candidates without four-year college degrees to fill positions and are open to instead filling these positions with those who have recognized certifications (66%), a certificate (66%), an online degree from massive open online courses (47%) or a digital badge (24%) (Maurer, 2018). The number one job skill American employees lack is interpersonal communication (Umoh, 2018). The results of this study show this skill can be practiced allowing students to improve these skills and become better prepared for the career path they have selected. Ultimately higher education leaders will determine whether the degrees they award become more or less obsolete over the next few years. Including Mursion® experiences in academic programs is a way to make degrees more relevant and provide graduates an advantage when entering the workforce because they will have been able to practice workplace situations gaining valuable experience.

The usage that was most effective in this study was that which was done in relation to program area and incorporated feedback, especially when the experience is repeated. Therefore, it is recommended that faculty utilize Mursion® in conjunction with feedback and self-analysis. Instructional design for communication training (Figure 1) and Kolb's Experiential Learning Cycle with Mursion® (Figure 2) and both mention the importance of reflection in experiential learning. Throughout the course of this study the importance of, and need for, reflection has been demonstrated. While removing the benefit of reflection and coaching does not quite negate the experience, it has been shown to weaken the value of it dramatically. In addition, it is recommended that students are provided multiple opportunities to practice simulations in courses directly related to their major to practice specific skills. The ability for students to practice,

receive feedback, then incorporate through another session can build confidence in the skills they are learning and the profession they are planning to enter. In addition, these sessions can also help the students to gain confidence that their chosen field is right for them or help guide them in a different direction before it is too late. For students interested in practicing outside of their coursework, it is suggested that students have the opportunity to purchase additional lab time with coaching and feedback provided by departmental representatives to develop communication skills.

To improve the administrative communication skills of future education leaders, universities providing any level of educational leadership program should consider aligning appropriate coursework to the use of simulations to practice.

Recommendations for Future Research

The research done for this study focused on students' communication skills at one university. It is recommended that research continue with students across additional curriculum areas but implementing the CSRS rather than the ICCS. The results of the ICCS did not reflect that of the interviews or the final feedback survey, but the CSRS can be used to compare the self-analysis to observer analysis through videos of Mursion® sessions. It is recommended that the research continue with students benefitting from multiple sessions whether in a single course or multiple courses and include faculty, peer, and self-feedback. Following a portion of these students after graduation in a longitudinal study to determine what effect, if any, the simulation experience had on their actual job performance, and choice would enhance the validity of the study.

Based on comments made by participants, a study reaching students earlier to help them to experience what a job in their planned major would be like would be beneficial and would be

interesting to determine how many find the experience to be what they had expected to be. Freshman, such as many of the athletes in this study, come into university undecided or loosely dedicated to a major. It would be interesting to find out if a simulated experience would help students to identify a major or to feel more confident in the major that they selected and possibly save the time they may otherwise spend changing from one major to another. Currently, students choose a major based on potential salary and job expectations (Selingo, 2017), but this would give them an opportunity to try it out with an actual experience.

The use of simulation as a professional development tool is spreading into several industries, but at the time of this study, no formal research has been done to show its effectiveness. To expand the research into professional development to the employees in higher education would be a natural extension. There is a wide range of skills that could be developed and practiced through simulation especially for new managers in conflict resolution and critical conversations. While Mursion® started out with a focus on training K-12 educators, developments in environments and avatars makes it possible now to use the technology in other industries. Mursion® currently works with Amazon, Starbucks, the Education Testing Service (ETS), and the Department of Defense, among others (C.Straub, personal communication, May 17, 2018) to provide training on topics such as leadership development, sales enablement, diversity and inclusion, critical skills for high pressure environments, improving clinical reasoning and bedside manner (Mursion, 2019). Universities across the world have started using Mursion® with their education programs and some, like the university that served as the site of this research, have started branching out to other programs as well. The advancements of this particular technology continue to roll out, as do new products. The key is that leaders need to take the initiative to find what works best for their program beyond what has always been done

to use as a recruiting tool and to provide students with the best advantage as they set out to implement all they have learned.

Conclusions

This study was designed to investigate the effect virtual role play activities have on developing students' communication skills through the use of Mursion®. The results of the study indicated that exposure to Mursion® provided little significant change on the ICCS scale, but that students did perceive benefit for their communication skills and reported they felt more confident going into similar situations. The qualitative results showed that multiple interactions were beneficial but were the most beneficial when coupled with coaching and/or feedback. Eighty-four percent reported some level of satisfaction with their experience, and over two-thirds would elect to use Mursion® on their own time to practice. While some participants did not report a benefit from the experience, no one reported it to be detrimental to them in any way.

Limitations in this study included the researcher's lack of courses of her own to study, so she had to rely on other faculty and their students to participate and follow through with no incentives. Also, Mursion® had only recently been made available to faculty outside of the College of Education when this study began. This mean that faculty typically encountered Mursion® for the first time during this study. This limited the number of classes who participated, the number of participants from start to finish, and their understanding of how to best use the tool.

Next steps from this study are to incorporate more programs into the trial to see how the technology benefits more programs than just the ones featured in this study. In addition, following social work students out into the field to find how the use of Mursion® affected them once they were working with real clients would deepen and enhance the findings of this study.

Many reported that they felt they were more prepared, and a survey or interview to find out if that were the case would be beneficial. Running this same study with staff at the university focusing on critical conversations would be very interesting and would possibly illuminate how the use of Mursion® could help those already in the workplace develop their communication skills. Another direction related to the athletes would be to involve another specialized population, such as veterans, and focus on an area they struggle with - transitioning from military life to college life. There are multiple directions for this project, and all of them would be beneficial to students as they begin, continue, or complete their college careers.

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APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** ·
www.ecu.edu/ORIC/irb

Notification of Continuing Review Approval: Expedited

From: Social/Behavioral IRB
To: Christine Wilson
CC:

Christine Wilson
Date: 7/11/2018
Re: CR00007050
UMCIRB 17-001582
Learning With and About Mursion@ECU

The continuing review of your expedited study was approved. Approval of the study and any consent form(s) is for the period of 7/11/2018 to 7/10/2019. This research study is eligible for review under expedited category #6,7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The Investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Document	Description
Background Survey(0.03)	Surveys and Questionnaires
Consent inside RedCap(0.01)	Consent Forms
Debrief Interview Questions(0.02)	Interview/Focus Group Scripts/Questions
Demographics(0.01)	Data Collection Sheet
Fall Optional Sessions(0.01)	Recruitment Documents/Scripts
Final Feedback(0.01)	Surveys and Questionnaires
Informed Consent for Mursion Repository - No more than minimal risk.docx(0.04)	Consent Forms
Interpersonal Communication Competence Scale(0.01)	Surveys and Questionnaires
Learning with and about Mursion Protocol(0.01)	Study Protocol or Grant Application
Teacher Candidate Perceived Anxiety Questionaire(0.01)	Surveys and Questionnaires
Teacher Efficacy(0.01)	Surveys and Questionnaires
Teacher Percieved Anxiety Questionaire(0.01)	Surveys and Questionnaires

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

APPENDIX B: APPROVAL TO USE IRB FOR STUDY

Wilson, Christine Marie

From: Mains, Annette N
Sent: Friday, December 14, 2018 7:43 AM
To: Wilson, Christine Marie
Subject: RE: IRB Question

Morning Christine,

There are no further steps you need to take since this falls under the protocol you submitted.

Regards,
Annette

Annette N. Mains
Office of Research Integrity and Compliance
University & Medical Center Institutional Review Board
East Carolina University
Brody Medical Sciences Building, Room 4N-64
Mailstop 682
Greenville, NC 27834
(252) 744-2914 (phone)
(252) 744-2284 (fax)

From: Wilson, Christine Marie
Sent: Thursday, December 13, 2018 5:11 PM
To: Mains, Annette N <MAINSA14@ECU.EDU>
Subject: IRB Question

Good afternoon. I am emailing to inform you that I am planning to use data gathered under UMCIRB 17-001582 (Study: Learning with and about Mursion@ECU) for my dissertation. The study was set up with the intent to use the data for research projects to be determined.

Please let me know if you have any questions or if there is anything further I need to do to proceed.

Thank you,
Christine Wilson

APPENDIX C: CONSENT FORM

As part of one of your classes, you will be using Mursion®. We would like to use that experience in a research project we are doing on Mursion®. Please review the consent forms and sign this survey to participate.

Please download the attached Informed Consent Document about this study. Feel free to ask any questions you may have before giving your consent using the contact information on the form.

[Attachment: "Informed Consent for Mursion® Repository - No more than minimal risk.pdf"]

1) After reading the consent form, if you agree, you should sign this form:
   - I have read (or had read to me) all of the above information.
     _____
   - I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
   - I know that I can stop taking part in this study at any time.
   - By signing this informed consent form, I am not giving up any of my rights.
   - I have been given a copy of this consent document, and it is mine to keep.
2) If submitting signed form rather than signing on survey, upload it here.
   1. Please download the attached Media Release Form. Feel free to ask any questions you may have before giving your consent using the contact information on the form.
   2. [Attachment: "Media_Consent_and-Release_Guidelines_5_21_2015.pdf"]
3) After reading the media release form, if you agree, you should sign this form:
   - I have read (or had read to me) all of the above information.
     _____
   - I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
   - I know the recordings used will only be used for this study and will not be available for public consumption.
   - By signing this informed consent form, I am not giving up any of my rights.
   - I have been given a copy of this release form, and it is mine to keep.
4) If submitting signed release rather than signing on survey, upload it here.
5) Date signed consent and release _____
   (DD-MM-YYYY)

APPENDIX D: DEMOGRAPHICS

Thank you for participating in our study to learn more about your experiences with Mursion®. First, we'd like to learn more about you. Please complete the survey below to get started. Thank you!

Contact Information - We are collecting this information for demographic purposes only, unless you agree to be contacted later.

First Name _____
Last Name _____
E-mail _____
Phone number _____
(Include Area Code)
Street, City, State, ZIP _____
Date of birth _____
(DD-MM-YYYY)

Ethnicity
- o Hispanic or Latino
- o NOT Hispanic or Latino
- o Unknown / Not Reported

Race
- o American Indian/Alaska Native
- o Asian
- o Native Hawaiian or Other Pacific Islander
- o Black or African American
- o White
- o More Than One Race
- o Unknown / Not Reported

Gender
- o Female
- o Male

Affiliation to Mursion@ECU
- o ECU Student, Faculty, or Staff
- o K-12 Teacher or Administrator
- o Other

Banner ID _____
Have you ever been a collegiate athlete?
- o No
- o Yes

Date Began at ECU _____
(DD-MM-YYYY)
Intended Graduation Date _____
(DD-MM-YYYY)

Program of Study _____
School District _____

Position _____

Degree(s) sought BA

- BS
- MA
- MS
- EdD
- PhD
- MSA
- MAEd
- BFA
- MFA
- AuD
- MBA
- DMD
- EdS

Have you done any kind of work (paid or otherwise) which caused you to interact with the public?

- Yes
- No

Please describe your experience(s).

_____

What is your comfort with Standard American English?

Very Uncomfortable < - - > Comfortable < - - >Very Comfortable

(Place a mark on the scale above)

May we contact you in the future about your experience?

- Yes
- No

Other information

Comments _____

APPENDIX E: INTERPERSONAL COMMUNICATION COMPETENCE SCALE (ICCS)

INSTRUCTIONS: Here are some statements about how people interact with other people. For each statement, choose the response that best reflects YOUR communication with others. Be honest in your responses and reflect on your communication behavior very carefully.

If you ALMOST ALWAYS interact in this way, circle the 5.
If you communicate this way OFTEN, circle the 4.
If you behave in this way SOMETIMES, circle the 3.
If you act this way only SELDOM, circle the 2.
If you ALMOST NEVER behave in this way, circle 1.

SELF-DISCLOSURE (alpha = .63)

1. I allow friends to see who I really am. *
2. Other people know what I'm thinking.
3. I reveal how I feel to others.

EMPATHY (alpha = .49)

4. I can put myself in others' shoes. *
5. I don’t know exactly what others are feeling. (R)
6. Other people think that I understand them.

SOCIAL RELAXATION (alpha = .63)

7. I am comfortable in social situations. *
8. I feel relaxed in small group gatherings.
9. I feel insecure in groups of strangers. (R)

ASSERTIVENESS (alpha = .72)

10. When I've been wronged, I confront the person who wronged me. *
11. I have trouble standing up for myself. (R)

12. I stand up for my rights.

ALTERCENTRISM (alpha = .49)

13. My conversations are pretty one-sided (R) *

14. I let others know that I understand what they say.

15. My mind wanders during conversations.

INTERACTION MANAGEMENT (alpha = .41)

16. My conversations are characterized by smooth shifts from one topic to the next. *

17. I take charge of conversations I'm in by negotiating what topics we talk about.

18. In conversations with friends, I perceive not only what they say but what they don't say.

EXPRESSIVENESS (alpha = .46)

19. My friends can tell when I'm happy or sad. *

20. It's difficult to find the right words to express myself. (R)

21. I express myself well verbally.

SUPPORTIVENESS (alpha = .43)

22. My communication is usually descriptive, not evaluative. *

23. I communicate with others as though they're equals.

24. Others would describe me as warm.

IMMEDIACY (alpha = .45)

25. My friends truly believe that I care about them. *

26. I try to look others in the eye when I speak with them.

27. I tell people when I feel close to them.

ENVIRONMENTAL CONTROL (alpha = .60)

28. I accomplish my communication goals. *

29. I can persuade others to my position.

30. I have trouble convincing others to do what I want them to do. (R)

Note 1. Items with asterisks are included in the Short-Form (SF) version.

Source: (Rubin & Martin, 1994)

APPENDIX F: PERMISSION TO USE ICCS

Wilson, Christine Marie

From: Matthew Martin <Matt.Martin@mail.wvu.edu>
Sent: Monday, April 2, 2018 1:45 PM
To: Wilson, Christine Marie
Subject: RE: Interpersonal Communication Competence Scale

Hello – you have our permission to use our measure. Good luck with your research – Matt Martin

From: Wilson, Christine Marie [mailto:wilsonch07@students.ecu.edu]
Sent: Monday, April 02, 2018 12:02 PM
To: mmartin@wvu.edu
Subject: Interpersonal Communication Competence Scale

Dear Dr. Martin,

I am a doctoral student from East Carolina University University writing my dissertation about the use of immersive technology to improve interpersonal communication skills in college students. In my research, I have come upon the Interpersonal Communication Competence Scale (ICCS) you developed and published on with Dr, Rebecca B. Rubin. I am very impressed with your work and would like your permission to use the ICCS instrument in my research study.

I would like to use in your survey under the following conditions:

- I will use the surveys only for my research study and will not sell or use it with any compensated or curriculum development activities.
- I will send a copy of my completed research study to your attention upon completion of the study.

If these are acceptable terms and conditions, please indicate so by replying to me through e-mail: wilsonch07@students.ecu.edu

Sincerely,

Christine Wilson
Doctoral Candidate

APPENDIX G: DEBRIEFING QUESTIONS

1. What did you think of your Mursion® experience?
2. What would you do differently?
3. What would you do the same?
4. What do you believe you have gained from this experience, if anything?
5. Is there anything you would like to add?
6. (Athletes only) What made you decide to volunteer to be part of this study?

APPENDIX H: FINAL FEEDBACK

1. Overall, how satisfied or dissatisfied were you with your experience in Mursion®?
2. What is one thing that you will take away from your Mursion® experience?
3. Has it changed your perceived comfort level in going into a meeting with a client? Please explain.
4. What did you like least about using Mursion® to practice? Be as specific as possible, and list as many aspects as you feel are appropriate.
5. What did you like most about using Mursion® to practice? Be as specific as possible, and list as many aspects as you feel are appropriate.
6. What would you tell peers about Mursion® who haven't experienced it?
7. Given the opportunity to come to the lab on your own time to practice, would you?
    a. If yes, what about the experience makes you want to come back on your own?
    b. If no, what would need to change in the experience to make you want to come back to practice?
8. On a scale from 0-10, how likely are you to recommend using Mursion® to a friend or colleague?

APPENDIX I: REVEALING RESULTS FROM GROUP D'S FINAL FEEDBACK SURVEY IN THE PARTICIPANTS' WORDS

Participant Gender Race Major Academic Year Birth Year	What did you like most about using Mursion® to practice?	What did you like least about using Mursion® to practice?	What would you tell peers about Mursion® who haven't experienced it?	What about the experience makes you want to come back on your own? *What would need to change in the experience to make you want to come back to practice?*
Male White Biochemistry Senior 1997	I appreciated how realistic the simulations were and how receptive the computer animation was to responses. I thought I did a good job handling the situations calmly and comfortably, and the computer seemed to reward this effort. For example, the professor was kind of angry at me during the beginning of the academic scenario, but I calmed him down and worked out a reasonable solution we could both agree on.	I did not like how short the situation set-up was. I would have preferred to have more details about the situation I was being placed in so that I could better tailor my answers.	It is a very good opportunity to practice daily communication skills that are crucial for success in everything you do.	The simulator was incredibly realistic. Practice is crucial to success with anything, and having the opportunity to practice such important conversations would be very helpful.

Male White Finance Senior 1997	The difficult situations you are put in.	Sometimes not very relevant	Try it out.	Always can improve in these situations. More comfortable the better.
Female Black or African American Public Health Junior 1998	What I liked most is that I felt like I was talking to a real human being	The only thing I didn't like was the surveys after every session but I know thats how the data was collected	This can change your attitude about the way you view your coaches	The technology and comfortable environment makes me want to come back on my own
Female Other Public Health Freshman 1996	The situations and having to be ready on the spot.	The avatar was weird at first but after I heard her reaction I was very comfortable.	Yes I think it's an experience that everyone should	To get better at talking to people
Male Black or African American Communication Freshman 1998	Having someone to talk to and not being judged about it.	Just talking to an avatar, it was kind of weird at first.	They should do it because it is god practice for communication.	It's just good practice for communication.
Male Black or African American Psychology Senior 1996			You won't experience anything like it. It'll blow your mind!	It was a cool experience that I feel would help me in future endeavors.
Male Black or African American Undecided Freshman 2000	How It was technology	it was not a real person	to try it	because it was cool technology

Female White Exercise Physiology Sophomore 1999	I thought it was extremely interesting. The topics were applicable to ours lives as athletes, and the avatar responses were extremely accurate with regards to both our sport and lives.	I was just a little bit uncomfortable talking with the avatar on the screen, I feel like I could have better communicated with an actual person.	Mursion was an interesting experience, and I would recommend participating if given the option.	If I could come back and practice interviews with potential employers by myself, I would.
Female White Operations and Supply Chain Management Senior 1996	It was extremely responsive and real life. Truly felt like I was talking to a person on the other side. It used industry specific lingo	It was kind of creepy how it knew stuff about me before we started. Made it seem like it was a real person on the other side or that it was being fed information. Wish they could have disclosed how the 'robot' was communicating with us.	Yes, and I did	It would be amazing interview practice!! Would be really cool to get to sit down and practice your elevator pitch or just prep for a job interview
Male White Finance Freshman 1998	I think it was really cool even though it felt weird	I felt weird to have a conversation with a computer	That they should try it, it is an experience	*Nothing really, just don't think it is necessary. It was cool to try it out but it's not like I feel that it would have a huge impact on me*

Male Other Geography Freshman 2000	The virtual avatar	Waiting on people in front of me	It's a fun experience	The virtual avatar
Male Black or African American Political Science Freshman 1999	I like that it gave me an opportunity to talk and know how to handle situations.	I did not like talking to a computer. It would have been better if I was talking to a actual person.	I would tell people that if given the opportunity they should definitely do it.	It was just a great practice tool.
Female White Finance Junior 1997	The ability to practice a conversation, and if it did not go as I wanted I would just learn from it.	What I liked the least was that one of the scenarios was unrealistic to me so I felt weird doing a simulation on it.	I would tell peers if they were discussing how they would want to practice a hard conversation.	If I feel uncomfortable talking about a situation I would be able to practice it.
Male Black or African American Undecided Other 1998	Seeing the avatar was cool	I felt like someone I didn't know was listening to my conversation in order to answer.	To try it out	*explaining to me who I was talking too*
Male White Business/MIS Senior 1996	That i can actually and free speak to the avatar and get a 'real persons' answer instead of just clicking through like in other surveys.	The big amount of the same survey questions between the sessions.	Its pretty good and more realistic than you would have thought in the first place.	The job interview session

Female White Public Health Freshman 1999	honestly i neither liked nor disliked it. i guess the whole thing was cool and the fact that it responded to my specific situation was interesting	it was weird to see the persons mouth move and then hear them speak. at times it was awkward because the responses were vague and not at all like my coaches but nothing was bad	i told people about it but wasnt like 'oh my gosh you should so go do this'	*i just wouldn't practice in general but if i did i would want a real person and actual problem/situation to talk about. not just a fake scenario that i have to make things up for*
Male White Business Freshman 1999	Being able to hear a response off what would happen by a coach or teacher.	It was a little weird ton talks to a cartoon.	They should do it because its interesting and also helpful not only for us but them too.	To help out, I feel like my answers and conversations with the computer were good and helpful so id love to help out.
Male White Urban Planning Freshman 1999	The realistic aspect	The surveys afterwards	To do it	I thought it was super realistic
Male Black or African American Sports studies Freshman 1999	The Mursion responding to what i said	Noting	It's a really cool research	It was was a good experience
Female White Communications Freshman 1999	The reality of it	It was weird not talking to a human	It's something to try	*I'm not sure I just don't like it*

Male White Sports studies Senior 1997	I really liked how life-like it was. It was the same exact feeling that I have felt in previous meetings.	There was not anything that I did not like about the experience.	Yes, I already have told others about it.	It is very similar to real life.
Female White Business Freshman 2000	I liked that I could practice talking to my coach	It was weird that the avatar knew exactly what I was saying and I did not like that I was the only one signed up for my session	It's fun but weird that the avatar knows what you're saying	It's good practice
Female White Accounting Senior 1997	That it gave a real life experience.	It was sort of awkward cause I feel I didn't have enough of a story to go off, especially the first practice with the teacher.	That it is a cool experience and would be fun to have a go at it!	*make the experience more about me and adapt it to me better.*
Female White Construction Management Freshman 1999	The conversation was really good, the robot gave me good answers	The avatar didn't look real enough		*The experience took too long (more than 2h)*
Male White Business Freshman 1999	the way the person talked to you	having to start the conversation with the person	that it is cool and it will help teach how to better communicate	
Male White Physical Education Senior 1996	I really enjoyed learning how to act in social situations. I enjoyed experiencing this technology.	I did not like being put on the spot but realize that it was attempting to be realistic.	I would tell them it was a neat experience and it was educational.	The use of technology.

Female White Undecided Freshman 1999	It helped me realize how to act with any type of administrator I come in contact with. The situations were all different and provided me with easy or hard conversations that I had to really think about what to say and what was appropriate.	There wasn't anything I did not like about it.	You learn great communication skills.	It gives me experience with all different types of clients.
Female White Biology Sophomore 1999	The thing I liked the most was how easy it was to interact with and understand the simulation. The scenarios were very realistic and applicable to the lives of students athletes. Even though not all of the scenarios directly applied to me, it was easy to how relatable they were.	I think my least favorite part was having the facilitator watch me interact with the simulation. I constantly felt like I was being watched. It makes me wonder if my answers would have been a little different if I had been alone with the simulator.	I would tell them that it was a very cool and unique experience. I would also tell them that this experience is a great example of tough conversations you may have to have in the future.	It was very applicable to the real life situations faced by athletes. Not all of the scenarios applied to me directly, but I'm sure there are other scenarios that may be more useful to me individually.
Male Black or African American Business Freshman 2001	The technology	Everything	It's amazing	I loved it a lot

Female Asian Engineering Junior 1997	Get to practice to speak with an administrator	It's uncomfortable	Nothing	*Nothing*
Female White Marketing Freshman 1999	It's useful to help learn how to communicate with an adult and helps you better understand how future conversations may go.	I did not like that the person I talked to kept making so many head motions and he didn't blink much.	I would tell them to try it because it's very beneficial to learning how to communicate.	I want to practice talking with professionals for job interviews.
Male Black or African American Psychology Freshman 1999	They teacher responded as a regular person would	N/A	It's seems so real	Practice makes perfect
Female White Speech and hearing science Freshman 2000	I believe it is a great practice for social skills in conversation	It made me nervous	It's very neat	It's unlike anything else
Female White Public Health Sophomore 1999	Being able to try new technology	Nothing	It's amazing and it opens up your mind about things	Just being able to sort of open up to someone

Note. This table shows the responses given by the athletes who participated in Mursion® on the Final Feedback Survey for four of the seven the open-ended questions. The responses give an insight into each participant's perception of the value of the experience.

APPENDIX J: REVEALING RESULTS FROM GROUP B'S FINAL FEEDBACK SURVEY IN THE PARTICIPANTS' WORDS

Participant Gender Race Major Degree Birth Year	What did you like most about using Mursion® to practice?	What did you like least about using Mursion® to practice?	What would you tell peers about Mursion® who haven't experienced it?	What about the experience makes you want to come back on your own? *What would need to change in the experience to make you want to come back to practice?*
Female White Audiology AuD 1993	I liked the following aspects of Mursion: -Realistic" -Real time -Avatar would acknowledge your weaknesses -You can end the session (if totally necessary)	I did not like that my peers surrounded me during the counseling exercises. I think that really hindered my ability to relax initially.	It's not as "scary" as it seems. It's truly like talking to an individual in a real clinic setting.	*I would need to not be aware of the situations prior to coming to Mursion. Being caught off guard would totally help me to gain more confidence in dealing with uncomfortable situations. In addition, offer a Mursion lab where the avatar cried or was genuinely angry would be helpful.*

Female White Audiology AuD Not Disclosed	It does put you into a situation that could very well happen in clinic and the emotions of the avatar could very well be what your patients express.	The avatar on this last session seemed harder to hear and also the signal was not the best.	Just relax and talk to the avatar like you would any other patient.	*More convenient location. Main campus is not easy to get too when you do not have the parking pass.*
Female White Audiology AuD 1994	It was nice to watch others counsel and learn what to do and what not to do.	There was often lag between the avatars. It made it difficult to find an appropriate flow of conversation rate. So, we would often speak at the same time by accident and my supervisor gave feedback that I was interrupting and needed to improve. Which is frustrating. Its also difficult to "pretend" when the avatar has limited insight into how a real patient would ask. It's also repetitive to watch the same simulation and same answers over and over, after 2 people go I already know what to expect and it's just redundant.	It was a unique experience. If given the chance to do it again, I would decline.	*It just doesn't compare to seeing real patients which I do every week. Might be better for a younger student.*

Female Not Disclosed Audiology AuD Not Disclosed			It is pretty realistic, so stay calm and act like it is a real patient!	
Female White Audiology AuD 1994	Having feedback and help from everyone when needed.		It's a great experience. Fun and educational.	It allows good practice as you are in the moment and don't know what the client will say.
Female White Audiology AuD 1994	The avatars say things that real patients do.	The delay between when they are talking. Many times, there was a conversation break and I would begin to talk and then what they said would come through. This could also be a delay in the body language of the avatars.	It is good if you don't have a lot of experience but not as helpful for those who have a lot of experience.	*This would have been helpful at the beginning of my program.*

Female Multiple Social Work MA 1989	EVERYTHING ABOUT IT. OBSERVING MY PEERS AND THEN PERSONALLY TRYING IT OUT, GETTING FEEDBACK, AND GETTING THE EXPERIENCE AND FEELINGS AS IF IT WERE A REAL COUNSELING SESSION.	NOTHING	YES	PRACTICING REAL LIFE SCENARIOS IN A PLACE WHERE I AM COMFORTABLE TO MAKE MISTAKES BECAUSE IT IS NOT AN ACTUAL CLIENT.
Female Hispanic/ Latino Social Work MS 1996	-gain experience -unpredictable scenarios -pause at anytime for help -helps identify areas for growth	Although helpful to do so, it felt uncomfortable practicing in front of everyone.	That it is a helpful tool and will put them in a scenario where they will have to think fast	To obtain more practice and experience with utilizing different methods of counseling
Female Black or African American Social Work MS 1995	I like that the clients are able to respond right away, to give students the real feel of talking to a client. I wish that we could use Mursion for practice courses.		I would tell them that it is fun but informative experience, and if they have the opportunity to do, they should definitely take advantage of it.	The experience is as if I am talking to a real life client, it gives me the experience that I need.

Female White Social Work MS 1980	The interaction with avatar	There was a delay in the speech; seem as volume was in an out		
Female Black or African American Social Work MA 1976	Live Interaction with the client, being able to stop and resume when you felt stuck. Overall I enjoyed the whole experience. I wish we had a second opportunity to do another one.	The time constraint was my least favorite of the Mursion experience	It's an awesome experience. I thoroughly enjoyed every moment and watching others.	The live interaction with the client. It was amazing.
Female Black or African American Social Work MS 1996	Being able to see my peers and their interviewing styles and approach.	There's nothing that I disliked.	I would tell me peers that it enhances interviewing skills and makes one more comfortable regarding interactions with clients.	To strengthen my interviewing and assessments skills.
Female White Social Work MS 1996	It still felt realistic as if a client was really there.	It was hard to hear what the client was saying at some points because the speaker would cut out.	It is nerve wracking but it is worth it.	It would give me a chance to work on the skills that need improvement without having to do it in front of a real client.

Female White Social Work MS 1997	Client interaction		Enjoyed it	The experience and practice
Male Black or African American Social Work MS 1985	it was good practice to test your ability to remain patient and really push yourself into trusting the process although many of the clients weren't interested.	I felt that the individuals on the other side portraying the clients purposely didn't want to consent to future treatment which made it very difficult to accomplish the goal.	its will challenge your ability to think quick on your feet as well as improvising to save the client and therapist relationship.	any practice to work on you skill level should be taken advantage of!
Female White Social Work MS 1976	Professor feedback	Being recorded; Having an audience; Lack of information before session, example not knowing what type of agency	Not to be too nervous	gaining experience
Female White Social Work MA 1991	The scenarios were realistic and the avatars responded as a real client would.		It was a fun experience but I also learned a lot.	I was able to practice my skills without having an actual client.

Female Black or African American Social Work MS 1961	getting that one on one client interaction	not having enough time to interact with the client	it will be exciting and educational for future social work clinicians	I learned a lot even though I made mistakes. It was very informative and education
Female Black or African American Social Work MS 1967	engaging in conversation with client and asking for feedback from peers	not enough time	I would encourage them to participate and explain to them the benefits of using Mursion to help with different techniques of counseling	It allows me to the opportunity to make a mistake that I can learn from
Female White Social Work MS 1995	the experience of one on one sessions	doing it in front of others	It is super cool and interesting. great practice	practice
Female Not Disclosed Not Disclosed MA Not Disclosed	Being able to interact with a new client.	Nothing	I would tell them that it was cool experience and that they should take it very seriously if they want to know more about how well they interview clients.	*I currently have a full-time job and Greenville is over an hour away from my home and job.*

Female Black or African American Social Work MA 1994	I liked being able to practice clinical skills, with a real-like client.	I liked everything. I do wish it was a bit louder and more clearer audio.	It was a cool way to practice and you should try it!	The ability to practice!! It was amazing!
Female Black or African American Social Work MA 1986	It is like a real life experience.		It is one of the most real-life practice experience that you can gain.	It is an opportunity for growth.
Male Black or African American Not Disclosed MA Not Disclosed				It's good practice for the future, and will help prepare me for what to expect in practice.
Female Asian Social Work MS 1994	This helps me to feel like I am legit talking to a real client.	I think that not knowing anything about the client and not having a background of what the Mursion lab is about until the day off is hard and causes me to be nervous.	Good luck! It's hard but it's fun!	*Nothing, I enjoy it but I would not come back unless I had to.*

Note. This shows the responses given by participants on the Final Feedback Survey for four of the seven open-ended questions. The responses give an insight into each participant's perception of the value of the experience.

APPENDIX K: CONVERSATIONAL SKILLS RATING SCALE (CSRS)

CONVERSATIONAL SKILLS RATING SCALE (Observer Rating of Conversant Form)							
Your Name:						Partner Name:	
Your ID:						Partner ID:	
Date:				Class:			Activity:
Rate how skillfully **THIS INTERACTANT** used, or didn't use, the following communicative behaviors in the conversation, where:							
1	=	**INADEQUATE**	(use is awkward, disruptive, or results in a negative impression of communicative skills)				
2	=	**FAIR**	(occasionally awkward or disruptive, occasionally adequate)				
3	=	**ADEQUATE**	(sufficient but neither noticeable nor excellent. Produces neither strong positive nor negative impression)				
4	=	**GOOD**	(use was better than adequate but not outstanding)				
5	=	**EXCELLENT**	(use is smooth, controlled, results in positive impression of communicative skills)				
Circle the single most accurate response for each behavior:							
1	2	3	4	5	=	(1)	Speaking rate (neither too slow nor too fast)
1	2	3	4	5	=	(2)	Speaking fluency (pauses, silences, "uh", etc.)
1	2	3	4	5	=	(3)	Vocal confidence (neither too tense/nervous nor overly confident sounding)
1	2	3	4	5	=	(4)	Articulation (clarity of pronunciation and linguistic expression)
1	2	3	4	5	=	(5)	Vocal variety (neither overly monotone nor dramatic voice)
1	2	3	4	5	=	(6)	Volume (neither too loud nor too soft)
1	2	3	4	5	=	(7)	Posture (neither too closed/formal nor too open/informal)
1	2	3	4	5	=	(8)	Lean toward partner (neither too forward nor too far back)
1	2	3	4	5	=	(9)	Shaking or nervous twitches (aren't noticeable or distracting)
1	2	3	4	5	=	(10)	Unmotivated movements (tapping feet, fingers, hair-twirling, etc.)
1	2	3	4	5	=	(11)	Facial expressiveness (neither blank nor exaggerated)
1	2	3	4	5	=	(12)	Nodding of head in response to partner statements
1	2	3	4	5	=	(13)	Use of gestures to emphasize what is being said
1	2	3	4	5	=	(14)	Use of humor and/or stories
1	2	3	4	5	=	(15)	Smiling and/or laughing
1	2	3	4	5	=	(16)	Use of eye contact
1	2	3	4	5	=	(17)	Asking of questions
1	2	3	4	5	=	(18)	Speaking about partner (involvement of partner as a topic of conversation)
1	2	3	4	5	=	(19)	Speaking about self (neither too much nor too little)
1	2	3	4	5	=	(20)	Encouragements or agreements (encouragement of partner to talk)
1	2	3	4	5	=	(21)	Personal opinion expression (neither too passive nor aggressive)
1	2	3	4	5	=	(22)	Initiation of new topics
1	2	3	4	5	=	(23)	Maintenance of topics and follow-up comments
1	2	3	4	5	=	(24)	Interruption of partner speaking turns
1	2	3	4	5	=	(25)	Use of time speaking relative to partner
For the next five items, rate this person's overall performance:							
POOR CONVERSATONALIST ::	1	2	3	4	5	6	7 : GOOD CONVERSATIONALIST
SOCIALLY UNSKILLED ::	1	2	3	4	5	6	7 : SOCIALLY SKILLED
INCOMPETENT COMMUNICATOR ::	1	2	3	4	5	6	7 : COMPETENT COMMUNICATOR
INAPPROPRIATE COMMUNICATOR ::	1	2	3	4	5	6	7 : APPROPRIATE COMMUNICATOR
INEFFECTIVE COMMUNICATOR ::	1	2	3	4	5	6	7 : EFFECTIVE COMMUNICATOR
Comments:							