7th Annual

teach live

Conference

MAY 22-24, 2019

Digital Approximations of Practice

University of Central Florida
Orlando, FL

Angelica Fulchini Scruggs
Mike Hynes
Lisa Dieker
Charlie Hughes
Timara Davis
Kate Ingraham
Annette Romualdo
Center for Research in Education Simulation Technology (CREST)

University of Central Florida
Orlando, FL

Conference Organizers
Angelica Fulchini Scruggs
Mike Hynes
Timara Davis
FORWARD
It is hard to believe that over 15 years ago the team at UCF first envisioned a different world in teacher preparation using simulation. At the helm of that vision was Michael Hynes who this year will officially retire from UCF. We dedicate this conference proceedings to his almost 50 years of work both at UCF and in making a difference in the lives of teachers. When Mike, Charlie, and I created what was originally known as TeachME that today is known as TeachLivE, which now has evolved into a UCF supported recognized CREST Center, we had no idea this work would spread, but most importantly no idea we would gain so many friends and colleagues who took this work into realms we did not even know were possible.

As you read this year’s proceedings we also dedicate it to the hard work of all who attended. These proceedings are not about UCF and the CREST Center, but how each of the presenters has taken an idea and elevated the work to do what is most important to each of us, impact the lives of teachers and the students they work with each day. We are so excited to share with you the 7th Annual Conference proceedings focused on Digital Approximation of Practice. We found the presentations this year aligned with three key areas of development. We saw presentations that helped teachers build stronger foundations before they went into the simulator, tools that supported teacher practice during the simulation experience, and numerous tools being developed to shape teachers’ behaviors after they left the simulator to ensure the practices teachers learned transferred back to their real classrooms. We also saw from our industry partners new emerging patterns and pathways for use in virtual and AI worlds. The UCF team was thrilled as people played with the elementary school avatars using immersive reality during our wonderful reception. The food again this year was delicious, and we must thank our amazing conference organizers, led by Angelica Fulchini Scruggs in collaboration with Michael Hynes and Timara Davis. Our reception was generously supported through funding by Mursion, and as always, we appreciated their support.

As you dive into these wonderful posters and conference papers helping to shape the Digital Approximation of Practice, we invite you to look for an invitation for a one-day conference to keep our connections more strongly aligned with the Interservice/ Industry Training, Simulation and Education Conference (I/ITSEC) in Orlando in December. The I/ITSEC conference is one the UCF team looks forward to each year, and we plan to have a one day mini-conference aligned with this event to continue to spread our wings to think about simulation education within and beyond teacher education. We hope you enjoy each of the works in these proceedings provided by our wonderful colleagues around the Globe. We look forward to seeing you next year for our 8th Annual Conference.

Again, thank you Dr. Michael Hynes for your decades of dedication and passion for changing the way we prepare teachers.

Fondly and Appreciatively,
Lisa Dieker
Charles Hughes
Angelica Fulchini Scruggs
CONFERENCE POSTERS
Students’ Perceptions on Teaching
Mark Savignano, Amy Scheuermann, Scott Page, & Madeline Cordle

Abstract
During this presentation we will discuss and demonstrate the use of TeachLeE™ have students’ perceptions of teaching is changing after introducing classroom management and instructional procedures, and moving their TeachLeE™ experience later in the semester. This is supported by video and qualitative evidence.

Description
In the Fall 2012, Minnesota State University Mankato implemented TeachLeE™ with our initial teacher preparation program. The results of the past six years have indicated specific trends. The pre- and post-surveys indicated three primary trends in confidence: an upward trend, a downward trend, a level trend and finally a drop followed by an upward trend. As we provided more information about the virtual students to the teacher candidates, the survey results improved. When the students received the simulated classroom experience, the results improved. When the students received the simulated classroom experience, the results improved. The implementation of new classroom management strategies for them to use. The more recent data collected from our research has found that students’ post-survey confidence in teaching has increased.

Method
- Participants: Fall 2013 to Spring 2019
- 159 participants
- Survey Design: Pre and Post survey, and reflective analysis
- Procedures and Response Rate: Looking for themes in open responses and video analysis

Data Analysis
- Prior to the introduction of the Context of Learning (Fall 2015) the pre-survey results of the teacher candidates’ perceptions were higher than their post-survey.
- With the introduction of additional student information (Context for Learning) in the Fall 2016 teacher candidates perception normalized between pre and post-assessments.
- By allowing more time before the TeachLeE™ simulation and introducing classroom procedures and instructional procedures, students’ confidence increased between pre and post-assessments.

Results

Conclusions and Implications: As teacher candidates were provided classroom instruction on classroom procedures, instructional procedures:
- Their confidence of teaching went up
- They realize the importance of classroom instruction and classroom procedures are to teaching

Implications for Practice: The teachers candidates perceived changes in their planning, preparation, practice, and procedures needs to be measured. This is where we are now focusing our research on reflective practices in the planning, preparation, classroom management, and instruction.
Preparing Future School Leaders: Building Generative Thinking Skills Via Mixed Reality Experiences

Marjorie Ceballos and Krista Bixler

ABSTRACT

The study sought to gain an understanding of how future school leaders could be prepared to engage in generative thinking in educational contexts. Mixed-reality experiences were designed to facilitate generative thinking by enabling the participants to think through and solve problems in a virtual environment, thereby enhancing their problem-solving abilities.

Problem/Purpose & Research Questions

- Problem: The literature suggests that mixed-reality experiences can foster generative thinking skills among future school leaders.
- Purpose: The purpose of this study was to explore how mixed-reality experiences could be used to develop generative thinking skills among future school leaders.

METHODS

The study was a mixed-methods design involving a qualitative and quantitative approach. The qualitative component involved open-ended interviews and focus groups, while the quantitative component involved pre- and post-assessments using a self-report survey.

CONCLUSIONS & IMPLICATIONS FOR PRACTICE

- Initial findings from the study show that mixed-reality experiences can be effective in fostering generative thinking among future school leaders.
- Future research could explore the long-term effects of mixed-reality experiences on generative thinking skills.

Initial Findings

The study found that the mixed-reality experiences positively impacted the participants’ generative thinking skills. Participants reported increased confidence in their ability to generate new ideas and solutions to complex problems.

Theoretical Implications

Future research could explore the role of mixed-reality experiences in developing generative thinking skills among future school leaders.

Practical Implications

Educators can integrate mixed-reality experiences into their teaching strategies to enhance students’ generative thinking abilities.

References

Embedding Two-Tiered Simulations into a Coaching Model

Stacy Ann Strang, Ann Marie Wernick
Southern Methodist University

PROJECT OVERVIEW

Live Simulation
Video recordings
Participant Facing Materials
World Building & Scenarios Development

SAMPLE USE CASE

Key Features of Simulation – flexible approach, four different 5-minute model teaching videos, live coaching intervention, feedback, mixed-reality coaching, feedback, middle school students, adult learners, background learner characteristics

GUIDING QUESTIONS

How might the materials and simulation parameters trigger different assumptions and tap different schemas?

How do two-tiered simulations influence coaching conversations?

How do different approaches to providing real-time feedback (peer-based and instructor-based) influence critical self-reflection?

What are the affordances and challenges of using simulations for supporting coaches in this new collaboration?

How can we create and share valid and reliable instruments that are usable across scenarios and attuned to contextual sources?

RESOURCES

World Building
Participant Facing Materials
Coaching Protocol

THEORY OF ACTION

Our theory of action is guided by the belief that high-leverage practices for instructional leaders can be identified and, subsequently, taught and internalized by novice and seasoned instructional leaders. We believe that simulations have the potential to support instructional leader learning because they provide an opportunity for novice and practicing instructional leaders to rehearse and analyze their instruction in contexts that can momentarily "freeze" their attention on specific aspects of teaching.

ACKNOWLEDGEMENTS

This work is in collaboration with Diane Gifford, Jennifer Peraia, and Paige Ware
Designing Computer Classroom Simulations for [Elementary] Pre-service Teachers to Practice Engaging Students in Math Talk

Presenters: Lauren Laughlin & Michael Ruffin

Researchers: Melva Grant & Sarah Ferguson

Old Dominion University

Harry the Dog, is standing in a line of 23 dogs, waiting to be washed. He is hot and impatient. Each time a dog is washed and Becky, the groomer, turns to let the dog into the cool doggie run, Harry sneaks ahead of two dogs. How many dogs will be washed before Harry?

**SIMULATION SUMMARY**

**Description:** Teaching through Problem Solving$^1$ using Before-During-After instructional model$^2$. The Before and During phases are completed and only the After phase is simulated.

**Goal:** The teacher facilitates Productive Math Talk$^3$ to share student solutions (provided), elicit good mathematics explanations$^4$, and assess student understanding and sense making.

**RESEARCH OVERVIEW & FINDING**

**RQ:** How has simulation influenced your preparedness & facilitation of math talk?

**Method:** Collaborative Self-Study Research

**Data:** Pre & Post-Surveys, teaching videos, individual & collaborative planning and reflective discussion board posts.

**Finding:** Improved online teacher preparation and student perceptions about readiness to teach.

---

**CAL STATE LA**

**Tracing the Effect of Embedding Cultural Practices in Virtual Education Environments**

Ravy S. Lao, PhD and Christina Restrepo Nazar, PhD
California State University, Los Angeles

**ABSTRACT**

In collaboration with Cal State Northridge, CSUN-ELT and the California State University's CSUN Urban Education Study Center in Los Angeles, CSU LA utilized the National Science Foundation’s (NSF) 2010 Office of Economic Opportunity’s (OEO) 2011-2014 program to enhance STEM education and outreach to underserved communities. This program aims to foster the creation of innovative STEM education materials with the potential for impact in underserved communities. As part of the program, CSU LA and CSUN have embarked on a collaborative partnership to develop virtual education environments for pre-service teachers.

Ravy S. Lao
Email: rlao@csulab.edu

Christina Restrepo Nazar
Email: nzar@csulab.edu

**INTRODUCTION**

White men teach education programs may not considerHopkins, and student teaching is a prerequisite to teachingin-service teachers 90% of the cohort applying to teach their firstgrade in the upcoming year. The program has been serving for years at CSULa as notably excruciating.

Examples of the population served include students whose participation in the CSULa and CSUN math education programs, as well as students who are English language learners, students with disabilities, and students who are underrepresented in terms of cultural background. This collaboration between CSULa and CSUN is based on the belief that virtual education environments can provide effective and equitable learning opportunities for pre-service teachers.

**METHODS**

Participants & Setting
- Four sessions of a single subject (real-life) module developed by authors in Fall 2018
- Total of 45 pre-service teachers provided (with 31 from CSULa, 14 from CSUN)
- Each session is designed to last 2 hours long, with portions devoted to lectures, problem-solving sessions, and discussion.
- The module includes a virtual environment designed to engage pre-service teachers in developing effective teaching strategies.

**THEORETICAL CONSTRUCTS AND METHODOLOGICAL APPROACH**

The theoretical perspective used in this study is the Experiential Learning Theory (Kolb, 1984) which emphasizes the importance of learners engaging in active, hands-on experiences as a means of learning. The study also draws on the concept of Cultural Practices (Pipher, 1987) to explore how a virtual environment can be used to facilitate the development of culturally responsive teaching strategies.

**RESULTS**

Engaging in a theoretical framework of cultural practices and virtual practices, the study found that pre-service teachers were better prepared to teach the module, showed increased confidence in their ability to create culturally relevant learning environments, and demonstrated improved teaching strategies. The study also highlighted the need for further research into the use of virtual environments to facilitate the development of culturally responsive teaching practices.
Students’ Perceptions on Field Experience Preparation
Madeline Cordle, Mark Savignano, Amy Schueermann, Scott Page

Abstract
During this presentation, we will discuss how students perceive that their TeachLive® experience has helped to foster fine motor skills in field placements or student teaching placements. Specifically, we asked about three factors: that their TeachLive® experience has helped enhance their children's fine motor skills, through skills like developing respect and rapport with students, and as returning to students to a different experience. This is supported through surveys and video recordings.

Method
- Participants: 52 students
  - 39 at Level 2
  - 13 at Level 4
- 100 hours of field experience and 10 weeks student teaching
- Survey Design: Pre-Post Field Experience survey, one survey for Level 2 and one for Level 4
- Procedure: Student cohort for one semester

Data Analysis
- Similar to previous questions at Level 2 and Level 4 surveys, 10 items based on Likert scales from 1-5, with 1 indicating least agreement and 5 indicating the most agreement
- Open-ended questions were explored for common themes

Results
- Students' perceptions of TeachLive®

Conclusions and Implications
- TeachLive® helps students develop their field experience and student teaching experiences
- Students are more likely to develop their ability to build respect and rapport with real students, as well as managing a classroom.

Implications for Practice
- TeachLive® prepared students for classroom management, responding to difficult behaviors and coping in front of a classroom.

Preparation Teacher Candidates to Utilize Behavior Observation Skills in a Simulated Environment
Shannon Budin, Ph.D.

Abstract
Preservice teachers must be comfortable and fluent in their ability to identify and evaluate challenging behaviors in the classroom. We will describe a process for using TeachLive® to improve their ability to operationally define target behaviors, select appropriate data collection instruments, and utilize interobserver agreement protocols. Perception data survey will be shared.

Rationale 1
- Graduate level teacher candidates have limited opportunities to develop behavior observation skills in supervised clinical settings.

Rationale 2
- Teachers must feel comfortable and be fluent in their ability to identify and evaluate challenging behaviors in the classroom.

Rationale 3
- Teachers' ability to select appropriate data collection tools and methods can impact instructional decision making as well as other high stakes decisions such as identification, goal setting, and service delivery.

Rationale 4
- Ability to generalize knowledge and skills in the “real” classroom is enhanced through opportunities to practice and receive immediate feedback/coaching.

Project Goals
- Improve preservice teachers’ ability to:
  - Identify behaviors
  - Operationally define behaviors
  - Collect data on problem behaviors in the classroom

Research Question:
How do teacher candidates rate their comfort levels on tasks related to direct observation of challenging behaviors before and after TLE®?

Research Design:
- Pre-Post Likert-type survey on comfort level related to:
  - Operationally defining target behaviors
  - Selecting appropriate data collection instruments
  - Calculating interobserver agreement

Phenomenological examination of simulation experience (feelings, value, etc.)

Time in simulation: 1 class session (approx. 1.5 hours total)

Participants:
- N=18 Graduate Students enrolled in Special Education Programs

Settings:
- Applied Behavior Analysis course required for Master’s Degree in Special Education
  - TeachLive® lab located on campus (seminar room)

Comfort Level Ratings
- Pretreatment
- Posttreatment

Noteworthy Responses:
Q: How did you feel when you had to interact with the student?
A: Comfortable

Q: What work experience previous you had today’s experience?
A: Meaningful
Implementation of Immersive Classroom Simulations with Math and Science Pre-Service Teachers

Dr. Tammy Lee, Dr. Carrie Lee, Dr. Ricky Castles, Dr. Daniel Dickerson, Dr. Holly Fales, and Dr. Christine Wilson
Department of Mathematics, Science, and Instructional Technology Education, College of Education

Abstract

This study investigated the effects of immersive classroom simulation activities on the development of elementary pre-service teachers’ mathematics and science content knowledge, beliefs, and practice intentions. Participants completed a 12-week simulation involving lessons taught by an elementary classroom teacher. Participants scored a mean of (x) on the pre-simulation survey, while participants scored a mean of (y) on the post-simulation survey (t-test, p < 0.05).

Methods

The study used a pre-post design, with participants completing a pre-simulation survey before the simulation and a post-simulation survey after the simulation. Data were collected through surveys, interviews, and observations. Pre-simulation and post-simulation surveys were administered to determine changes in participants’ beliefs and knowledge in mathematics and science.

Results

Participants showed significant increases in their mathematics and science knowledge and beliefs (t-test, p < 0.05). Participants also reported an increase in their practice intentions for using simulation activities in their future teaching (t-test, p < 0.05).

Conclusions

The findings of this study indicate that immersive classroom simulation activities can be an effective tool for improving pre-service teachers’ content knowledge and beliefs, as well as their practice intentions. These findings have implications for the preparation of future teachers and the design of new teaching strategies in mathematics and science education.

References


Developing Students’ Communication Skills through Virtual Role Play Activities
A Dissertation

Research/Study Design

Research Question 1

How do students’ self-assessed views of their ability to communicate change after they have participated in at least one Murmur® activity that was embedded in the course curriculum?

Research Question 2

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

Research Question 3

How do students’ self-assessed views of their ability to communicate change after they have participated in at least one Murmur® activity that was embedded in the course curriculum?

Conclusions

- Students' prerequisite for their communication skills and reported they felt more confident going into similar situations after participating in Virtual Role Play activities.
- Multiple interactions were beneficial, but were the most beneficial when coupled with observing and discussing them.
- All reported some level of satisfaction with their experience.
- Over two-thirds would like to use Murmur® on their own time to practice.
- While some participants did not report a benefit from the experience, no one reported it in any way detrimental.
Using Virtual Practice to Boost Social Work Students’ Professional Confidence

Authors: B. Marie White, Christine Wilson, East Carolina University, whit8801@students.ecu.edu, wilson@ecu.edu

Research Questions
- Do students think Millennials® be at a viable resource?
- Did students feel better about their skills after using Millennials® second time?

Research Design
Social Work students completed two practice sessions with Millennials® one in January 2014 and another in Fall 2014. After their first session, students completed surveys comparing their experience with the Human one as well as in commenting on personal strengths and weaknesses.

Data Collection
Surveys were coded in NVivo for key words dealing with personal reflections and strengths using Millennials®

Student Thoughts on Millennials®

"Overall, I think this experience is a great teaching and practice tool. The richness of a computer program allows to explore as well as in a more meaningful way than we ever could. However, this is a much more realistic environment than the clinical encounter, ready to be accessed and signed up for the service."

Student Reflections on Skills

"Even though I felt a lot more confident I felt so, I didn’t feel as if I had better at my first go around. I think the reasons that I didn’t better in the first go around because I was able to relate to that virtual individual better than I could any real virtual individual. I think that I am not real doing that I should probably get rid of doing with clients that way."

Discussion

It is critically important for social work practitioners to conduct adequate clinical assessment and therapeutic experience to address clinical needs. Social work practitioners were able to address the differences between the Millennial generation and the traditional generation, especially those suffering from substance use disorders.

Next Steps

Continue to have students use the program. Continue to collect qualitative data to determine effectiveness of program.
Using TeachLiveE to Give Authentic Feedback to Preservice Teachers

Sarah McMahan, Ph.D. and Ed Steffeck, M.Ed.

Abstract
Preservice teachers are often anxious about teaching a mini-lesson in front of students while their professor watches the lesson. This session details students' perceptions about the effectiveness of immediate feedback following the TeachLiveE lesson, and presents data suggesting that preservice teachers feel more confident in their abilities to reteach a concept again following a meaningful debriefing session.

Assignment Details
It is important that preservice teachers have multiple opportunities to practice instructional techniques in authentic experiences prior to stepping foot into the student teaching. Students enrolled in a undergraduate Instruction/Assessment and Classroom Management class prior to the student teaching semester devised and implemented mini-lessons in the TeachLiveE lab.

Findings
Immediate feedback following the students' presentation allowed the professor to ask questions as well as give students opportunities to clarify "why they did what they did" in a situation.

"I noticed that I did a lot better than I thought. I really liked how I told students good job when they got a question right, but I had no idea that I only called on one side of the room. Thanks for pointing that out."

"I didn't know I didn't call on Maria. Thanks for tallying who I talked to. I would have never picked up on that if you didn't tell me right away."

"I'm glad you and Dr. Dunlap gave us feedback in the debriefing session. You all saw things I wouldn't notice because I am so focused on how I presented the material."

Discussion
Providing students with immediate, purposeful feedback following a lesson can be instrumental in helping preservice teachers refine pedagogical skills (Britton & Anderson, 2010). While having students self-reflect following a presentation in the lab is insightful, the opportunity to incorporate professor feedback at the same time allows preservice teachers to think deeper than just "surface level."

Moreover, immediate feedback from an instructor allows students to consider various aspects of the lesson implementation rather than just their own perceptions. As teacher preparation programs continue to devise practical ways for students to demonstrate knowledge and skills of effective content pedagogy, virtual environments that allow opportunities for instructor feedback can strengthen overall teacher candidate development.

Literature
Fixon et. al (2005) notes that effective teacher training programs include providing opportunities for students to practice pedagogical skills with specific feedback. Moreover, researchers Scheiter, Ruhl, & McAfee (2004) contend that students “acquire and maintain behaviors best when they received systematic instruction, have multiple opportunities to practice and receive feedback that is immediate positive and corrective and specific” (p.120).
CONFERENCE PAPERS
Using Virtual Practice to Boost Social Work Students’ Professional Confidence

B. Marie White, Christine Wilson
East Carolina University

ABSTRACT

Finding effective practice for Social Work training can be difficult. Being thrown into a real-life, high stakes situation with no prior experience can cause mental scarring for both a counselor and the counseled. Social Work students using Mursion® for instructional practice view the system as a suitable resource. They find working with the avatars in lieu of a human participant to be beneficial to their overall preparation for their future career. By viewing student essay responses written after their second time using Mursion®, we see a pattern of students providing praise for the program along with personal reflections on how they can better themselves for next time.

Keywords: Social Work, Interpersonal Communication, Augmented Reality, Immersive Reality, Communication Skills, Student Development

Introduction

In the Social Work profession, as in other clinical professions, it is unethical for students to work directly with patients before they have demonstrated proficiency in effectively applying specific clinical skills. As stated by the Council of Social Work Education’s Educational Policy and Accreditation Standards (2015), students need to “demonstrate ethical and professional behavior” (p.7). Social Work students are to do this part by using “supervision and consultation to guide professional judgment and behavior” (Council on Social Work Education, 2015, p.7). Traditionally, the only way students could demonstrate their clinical skills was by participating in role-play exercises with other classmates or paid actors. Through the use of Mursion®, students
are afforded the opportunity to engage with lifelike simulated clients to practice and demonstrate proficiency in their clinical skills.

Mursion® provides students with a safe environment in which they can practice as well as receive feedback and guidance from their peers and instructor on ways to improve their clinical skills (Dieker et al., 2014). Mursion® is an immersive interactive simulator utilizing diverse lifelike characters within several different settings which was initially created as TeachLive and designed for preservice teachers but has expanded to other disciplines.

This study followed a group of Social Work students who are specializing in substance abuse through two courses, both of which incorporate a single Mursion® session. In one session, the students lead a counseling session with an adult simulated client, and the second is either a similar session or a group therapy session with adolescent clients.

**Methodology**

**Participants**

The participants were Social Work students who were taking classes at East Carolina University for both Summer and Fall semesters of 2018. They had to be taking a class that required them to use the Mursion® Lab at least once per each semester.

**Design**

Students were assigned either as a class or individually to use the Mursion® Lab once during the Summer semester and again during the Fall semester of 2018. Students would either work with an avatar acting as an individual meeting with the counselor for the first time or a group of middle school avatars for a group therapy session. If the student was acting as a counselor to a single individual, the goal of the session was to have the client sign a consent form to come back for more sessions. If they were working with a group of adolescents, the goal became to decide
who needed the most focus and have the others in the group session assist that patient with the issue presented.

During their simulation, the professor and sometimes peers were at hand in case the student needed to pause the simulation to ask for assistance or clarification on where to go next with the client. After the allowed time, the professor would stop the simulation and allow a few minutes to discuss the session: what went well and to how to better handle what did not go well.

**Data Collection**

Students were assigned to write an essay about their Fall 2018 experience. This essay included a brief description of thoughts and feelings before and during their simulation, an overview of the simulation situation, a self-reflection of what did and didn’t work, and a comparison between their first and second simulation session.

Eight of the collected essays were randomly chosen for research. The eight chosen essays were coded in NVIVO based on students’ responses to using Mursion® and self-reflection on skills. They were analyzed for positive or negative keywords.

**Results**

**Qualitative Results**

About 90% of the essays analyzed indicated Mursion® is a useful tool in place of a human subject. Students commented on how the avatar was more lifelike than they thought it would be. They expected textbook scenarios and preprogrammed answers but instead were handed unique characters, a vast array of issues, and even pushback from the client. The latter causing the most shock to the participants.

"Overall I think this experience is a good teaching and practice tool. The reluctance of a computer generated client to accept or seek services or assessment
caught me off guard. I guess that was the case because I expected a program
designed as an instructional tool to lean towards exploring treatment options
rather than offer resistance. However, this is a much more realistic scenario than
the client coming in, ready to be assessed and sign up for services." -female social
work student

With self-reflection, students were able to point out things they did well compared to last time as
well as skills they needed to better for the next session.

"Things I did well in the lab would possibly be my ability to stay calm
when the client was refusing to share and give me identifying issues. I felt that I
did an ok job of giving psycho education of how the alcohol affected his
judgement. Had this not been a time session I feel that overtime I could have
persuaded the client to side consent." -male social work student.

Even if a student felt that they did not do as well on this second session as they did on their first,
they were able to analyze why.

"Even though I felt as if I had more confidence I felt as I did better in my
first go around. I think the reason that I did better in the first round was because I
could relate to my first virtual individual better than I could my second virtual
individual. I think that is one real thing that I should probably get used to –
connecting with certain clients and not others. However, I think it is important to
not let that get in the way of how you decide to help the individual." -female
social work student
Discussion

It is critically important for Social Work practitioners to conduct in-depth clinical interviews. Evidence-based practices in social work have practitioners developing their own evidence, along with drawing from qualitative methods and data (Pollio, 2006). To build evidence for determining the best course of action for a client requires the Social Worker to find “factors within the session” (Pollio, 2006). Failure to complete a thorough assessment to find these factors needed to create the best course of action can mean the difference between life and death for some patients, especially those suffering from substance use disorders.

Looking at our qualitative data, we can conclude that Mursion® assists students with collecting evidence to build a plan of action for the client in a high stakes professional setting so they can focus more on the individual they are assisting. The practitioners-in-training are able to interact with a human-like avatar, and even better, they are allowed to make mistakes as well as pause to ask for help, which are things they cannot do in a real-life situation.

Summary

Students training to go into social work need to be confident in their professional abilities. To waiver or be unsure in front of a client can spell certain doom. Clients may come in because they are actively searching for help, made to go for legal reasons, or looking for help for a friend/family member. Success depends on the counselor displaying a set of skills that allows the client to feel at ease and able to trust their counselor.

However, using actual clients to train unsure counselors can put both individuals at risk. For the client, the counselor may cause the client to feel ill at ease and not seek additional help. The client could become violent due to feeling distrustful of the counselor. For the counselor, they may get discouraged from an appointment going poorly or possibly be hurt by a violent client. To keep
both parties from lasting harm, it is vital to find other ways to train practitioners. Role-play can only go so far. The person pretending to need services may not be well versed on how to play the part. They could be someone the counselor-in-training knows and/or respects, causing the situation to lose its realism.

This study has demonstrated that Mursion® is a proper stand-in for human subjects. The avatars are very realistic, being able to react in real time during a simulation. The simulation can be modified for many different real-life situations, ranging from grieving over the death of a loved one to assisting an oblivious substance abuser with their addiction. Students are able to gain confidence in their professional skills along with reflection on what went well and what to work on for next time.

For our next steps, we will continue to have students use the program. Simulations will continue to be created to assist in strengthening skills students identified as in need of bettering. More qualitative data will be gathered to determine the continued effectiveness of this program.


A Study on Teacher Candidates’ Questioning Strategies for English Learners through a TeachLivE™ Experience

Dr. Donita Grissom University of Central Florida

Dr. Michele Regalla University of Central Florida

Florida Introduction

Demographics within U.S. PreK-12 schools have shifted whereby classrooms have become increasingly ethnically and linguistically diverse. The National Center for Education Statistics (NCES; 2018) reported that 4.8 million students were considered as English learners (ELs). Approximately 80 percent of teachers noted that they felt underprepared to teach ELs in their classrooms (Durgunoğlu & Hughes, 2010; McGraner & Saenz, 2009).

Teachers need to understand effective strategies for teaching ELs (de Jong & Harper, 2005). We take the position that communication barriers can be reduced when teacher preparation programs focus on meeting the needs of ELs. Specifically, we argue that by introducing and practicing effective questioning strategies, educators better engage ELs and facilitate their ability to express their learning. Further, by considering ELs’ English language proficiency levels when asking comprehensive questions, teachers are better positioned to determine if their ELs have successfully comprehended academic content (Pappamihiel & Mihai, 2006). The purpose of this study was to examine a TeachLivE™ experience focused on questioning strategies for ELs, at three English proficiency levels (i.e., beginning, intermediate, advanced), that is embedded into a teacher preparation program.
Literature Review

Importance of Teacher Questioning

Questions have historically been fundamental educational tools to activate students’ intellectual skills (Aydemir & Çiftçi, 2008). Teachers understand that student engagement is critical for student success with research demonstrating that higher levels of student engagement is a “robust predictor of student achievement in school” (Klem & Conell, 2004, p. 262). When executed properly, questions are instrumental in inspiring students to actively engage in classroom instruction and enhancing their critical thinking skills (Cotton, 1988; Gall, 1984; Hu, 2015). In a meta-analysis of over 100 studies, questioning has been highlighted as one of nine most effective teaching strategies (Marzano, Pickerigg, & Pollock, 2001). However, teachers must be adequately prepared to engage ELs in meaningful classroom talk with effective questioning strategies (Döş, Bay, Aslansoy, Tiryaki, Çetin, & Duman, 2016).

Studies have shown that up to 80 percent of instructional time is dedicated to teachers questioning students (Marzano et al., 2001). However, research has raised many concerns regarding the quality and purpose of questions asked in instructional settings. Display, or closed, questions are the most common types of questions asked by teachers (Albergaria-Almeida, 2010). As such, students simply repeat factual information back to their teacher. In display questions, little to no critical thinking is needed to answer questions with a pre-determined answer or recall of factual information (Barnes, 1969; Cullen, 2002; Ellis, 2008; Long & Sato, 1984). In fact, 60 percent of all teachers’ questions are display questions (Albergaria-Almeida, 2010) as opposed to referential questions that are more open-ended in nature (Ellis, 2008; Long & Sato, 1984).

Modifying Questions for ELs
Studies conducted in English for speakers of other languages (ESOL) classroom settings indicated no difference in the frequency at which teachers question their students nor in the types of questions asked. Long and Sato’s (1984) study demonstrated that over 900 questions were asked in a span of six elementary lessons with ELs. Tsui (1995) established that 70 percent of instructional time was spent on teachers questioning their students. Because it is vital that teachers informally assess ELs for comprehension during a lesson (Hill & Flynn, 2006), serious consideration must be paid to teachers’ questioning strategies so that ELs do not miss significant academic content (Author, 2001). Also, teachers must create interactions with ELs that are meaningful rather than limiting their verbal interactions to display questions. In the context of language development, Ellis (2008) defined negotiation of meaning as the mutual understanding reached by both the EL and teacher through interactional modifications, including comprehension checks and clarifications. Therefore, it is imperative that teachers of ELs know their individual English proficiency levels as well as the appropriate types of questions that can be both understood and answered by the ELs at their respective English proficiency level (Hill & Flynn, 2006).

The World-Class Instructional Design and Assessment (WIDA) is dedicated to the design and implementation of high standards and equitable educational opportunities for ELs. Among their Can-Do Descriptors are discourse characteristics depicting what ELs at each English proficiency level can understand and/or perform, as shown in Table 1.
Table 1

<table>
<thead>
<tr>
<th>Level</th>
<th>Discourse Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entering – Level 1</td>
<td>Single words</td>
</tr>
<tr>
<td></td>
<td>Phrases or chunks of language</td>
</tr>
<tr>
<td></td>
<td>Phrases or short sentences</td>
</tr>
<tr>
<td></td>
<td>Expression of ideas</td>
</tr>
<tr>
<td>Emerging – Level 2</td>
<td>Some expanded sentences with emerging</td>
</tr>
<tr>
<td></td>
<td>complexity</td>
</tr>
<tr>
<td></td>
<td>Expanded expression of one idea</td>
</tr>
<tr>
<td></td>
<td>or multiple related ideas</td>
</tr>
<tr>
<td>Developing – Level 3</td>
<td>Some complex sentences</td>
</tr>
<tr>
<td></td>
<td>Organized expression of ideas</td>
</tr>
<tr>
<td></td>
<td>with emerging cohesion</td>
</tr>
<tr>
<td>Expanding – Level 4</td>
<td>Multiple complex sentences</td>
</tr>
<tr>
<td></td>
<td>Cohesiveness</td>
</tr>
<tr>
<td></td>
<td>and coherency</td>
</tr>
</tbody>
</table>


Aligning with WIDA’s Can-Do Philosophy and “the belief that all students bring to their learning cultural, experiential, and linguistic practices, skills, and ways of knowing from their homes and communities” (WIDA, 2014, p. 3), teachers of ELs have the responsibility to build upon their students’ cultural, educational, and linguistic backgrounds and skills. WIDA’s (2014).

Can-Do Descriptors address four content areas (i.e., social studies, mathematics, science, and language arts) and recognize that both language acquisition and negation of meaning are achieved through teachers’ instruction and scaffolding. Within these content areas, WIDA (2014) has outlined model performance indicators accounting for each of the five levels of English proficiency as shown in Table 1. Additionally, the indicators interconnect the ELs’
linguistic functions and processes, respective to their individual English proficiency level, the instructional content, and the instructional support strategies that may help bridge language and content for the ELs (WIDA, 2014).

**Scaffolding Questions for ELs**

Research has shown that the differentiation of questions for ELs through scaffolding serves as an effective method of checking for understanding and facilitating language development for ELs of all English proficiency levels (Kim, 2010; Nutta, Strebel, Mokhtari, Mihai, & Crevecoeur-Bryant, 2014). Through scaffolding, teachers can differentiate the types of questions so that the questions are both comprehensible and meaningful to their ELs. Scaffolding encourages learner autonomy in which students take ownership and responsibility for their own learning. In addition, scaffolding allows ELs to be successful and gain a sense of confidence in their ability to respond successfully to their teachers’ questions. Teachers of ELs raised their ELs’ level of participation through scaffolded questions that allowed for sufficient participation opportunities that went beyond simple, display questions and responses (Kim, 2010). Furthermore, when teachers pose questions at their ELs’ individual English proficiency level, they engage their ELs by affording them the linguistic ability to comprehend and respond to the questions as well as focus on academic content (Nutta et al., 2014).

Teachers of ELs must remember that proficiency fluctuates in different contexts; therefore, effective teachers consistently modify their questions and the directionality for each question in order to meet their ELs’ individual English proficiency level (Kim, 2010). When teachers ask questions that are comprehensible to ELs while simultaneously providing enrichment that is “a little beyond where they are now” (Krashen, 1982, p. 21), this
negotiation of meaning increases the relevancy of teacher-student interactions (Ellis, 2008). This type of questioning has been referred to as differentiating questions, scaffolded questions, tiered questions (Hill & Flynn 2006), and more recently, leveled questions (Nutta et al., 2014). The current study assumed leveled questions, based upon the Natural Approach (Krashen & Terrell, 1983), to describe this questioning type. Leveled questions provide opportunities for teachers to realize whether ELs' responses are limited due to their overall understanding of the content or their level of English proficiency (Nutta, Strebel, Mihai, Crevecoeur-Bryant, & Mokhtari, 2018).

Scaffolding TCs through TeachLivE™

Researchers have verified that teaching and learning is enhanced when teacher candidates (TCs) have several experiences to apply strategies learned from their courses’ curriculum (Allsopp, De Marie, Alvarez-McHatton, & Doone, 2006; Pryor & Kuhn, 2004). In order to provide a mediated experience for TCs to practice their classroom communication skills with ELs, a mixed-reality environment of a classroom simulation, called TeachLivE™, was used. The TeachLivE™ classroom simulation is an avatar-based simulated middle school classroom environment combining human intelligence and computer animations displayed on a television screen. Candidates interact with the simulation classroom by posing verbal questions to the avatar students and receive EL “student” responses in real-time.

The goal of the classroom simulation experience in this study was for the TCs to practice oral communication and questioning strategies with virtual ELs in an environment where the instructor can scaffold these interactions. For this study, a class of five avatars was used featuring three avatar students representing different levels of English proficiency (i.e.,
Research has shown the TeachLivE™ experiences provide for personalized learning and the suspension of disbelief with an environment that looks, feels, and reacts like a “real” classroom but contains virtual reality avatar students (Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014). Further, research corroborates the importance of providing opportunities, such as the simulation classroom, that encourage TCs to enrich their skills in supporting the language development and curriculum needs of ELs in a non-threatening atmosphere (Author, 2001).

This study addressed the following research questions:

1. Is there a change in TCs’ questioning strategies for ELs after participation in a TeachLivE™ classroom simulation? If so, what changes occur?

2. Is there a difference between TCs’ questioning strategies for ELs according to level of English proficiency (i.e., beginner, intermediate, advanced)?

**Methodology**

**Setting and Participants**

This study took place in an ESOL methods course within a university’s teacher education program designed to prepare TCs of all content areas and grade levels to work with ELs in PreK-12 schools. The ESOL methods course from which the study took place prepares TCs to teach ELs that enter U.S. classrooms from other countries as well as prepares the candidates to teach ELs in an international context, such as teaching abroad. A convenience sampling was used to recruit the undergraduate TCs who participated in this study. Data was obtained during one semester from two different sections of the course. Of the 103 TCs who participated in the study, 77 percent were female and 23 percent were male. Thirty-seven percent of the participants were in the Elementary Education program and the
remainder were from various secondary content areas or related fields, such as educational psychology. Demographically, 66.5 percent identified as Caucasian, 16.2 percent Latino, and 13 percent Black with the remainder identifying as multiracial or “other”.

**Data Collection**

Data collected for this study consisted of the TCs’ written assignment, named the leveled questions (LQs) assignment, and an open-ended questionnaire. Prior to the workshop conducted for this study, the TCs were assigned to read a chapter in the course text that addresses questioning strategies for ELs of varying English proficiency levels. Sample question types appropriate for three levels of English proficiency (i.e., beginning, intermediate, and advanced) are provided within the chapter. In the text, question types are categorized based upon linguistic features such as verb tenses, sentence structure of the questions, and amount of language required to formulate a response. Table 2 shows the sample question types from the text that were chosen for use in this study.

**Table 2**

<table>
<thead>
<tr>
<th>Level</th>
<th>Question Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginner</td>
<td>One-word answer – Yes/No</td>
</tr>
<tr>
<td></td>
<td>One-word answer – Either/Or</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Interrogative questions</td>
</tr>
<tr>
<td>Advanced</td>
<td>Questions using progressive use of conditional</td>
</tr>
<tr>
<td></td>
<td>Complex sentence structure</td>
</tr>
</tbody>
</table>

The TeachLivE™ experience took place in the next class meeting after the assigned reading on EL questioning strategies. Because the participating TCs were of varying content areas (e.g., Elementary Education, Social Studies, etc.), the candidates were shown a set of non-academic visuals featuring people involved in recreational activities, such as attending
a concert or a picnic. Using these visuals as a prompt, the TCs were asked to write two rounds of questions appropriate for each of the three different EL proficiency levels addressed in the text. The TCs wrote two questions for each proficiency level based upon the sample question types presented in their course text in Round 1. Next, the TCs participated in an in-class workshop with TeachLivE™ containing the five avatar students. Each TC asked his or her set of questions written from the first round to the EL avatars. In doing so, they addressed an EL avatar that represented an EL with beginning, intermediate, and advanced English proficiency. During the TCs’ interactions with each of the avatars, the course instructor provided coaching as necessary. After the workshop, the TCs revised their first round of questions based on the lessons learned during the TeachLivE™ experience.

The LQs assignment contains the TCs’ original set of six questions written in Round 1 and the revisions of these six questions based upon their interactions with the EL avatars written in Round 2. Finally, the TCs completed an open-ended questionnaire regarding their experiences with TeachLivE™.

Data Analysis

The LQs assignment was analyzed for changes between the TCs’ initial questions from Round 1 to their revised questions from Round 2. Each question written was categorized by question type shown in Table 2, and all types were tallied into a frequency distribution.

Additionally, all questions were separated amongst the three English proficiency levels for which they were written, and all questions were analyzed within their respective round, as reflected in the frequency distributions. The responses to each question from the questionnaire were analyzed for patterns and themes. Each piece of information was broken
into segments and then analyzed for meaningful units and themes (Gall, Gall, & Borg, 2007). The themes found in the questionnaire responses were used to support the findings shown in the frequency distributions.

The data from both the LQs assignment and the questionnaire were cross-checked by each author for inter-rater reliability.

**Findings**

The findings presented consist of data collected from the LQs assignment and the TCs’ responses to the open-ended questionnaire. Four themes emerged within the questionnaire’s responses: (a) TCs’ overall experience with the simulated classroom, (b) TC’s overcoming communication barriers with beginner ELs, (c) TCs’ overgeneralization of beginning level questioning strategies for intermediate and advanced levels, and (d) TC’s use of “filler language.” Findings are presented thematically with selected quotations taken from the open-ended questionnaire to support the numerical data listed in the tables. Tables are used to present frequency distribution data from the LQs assignment and the questionnaire. Data from the LQs assignment is reported according to the three English proficiency levels and categorized as Round 1 and Round 2 to show a comparison of the differences in question types for each round. **Theme 1: TCs’ Overall Experience with TeachLivETM**

Of the 103 TCs, 61 reported prior experience with ELs and eight reported prior experience with TeachLivETM. Moreover, 21 TCs denoted having had prior experience with ELs through volunteering and/or tutoring in PreK-12 ESOL programs. The majority of TCs (70) relayed an overall positive experience with the use of the simulation classroom by stating that it seemed realistic and provided good experience for interacting with ELs. Despite an overall positive experience, some TCs mentioned struggles they encountered
during the classroom simulation. Table 3 shows the frequency distribution of TCs’ responses regarding their overall experiences and impressions of interacting with the EL avatars in the classroom simulation.

Table 3

<table>
<thead>
<tr>
<th>Theme 1: TCs’ Overall Experiences with the Simulated Classroom</th>
<th>Overall Experience</th>
<th>Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall positive experience with the classroom simulation</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Realistic experience interacting with ELs</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Overall negative experience with the classroom simulation</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Struggled to differentiate among the 3 English proficiency levels</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>Experienced difficulty communicating with EL avatars</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Struggled with their own speech during classroom simulation</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

Within Theme 1, 70 TCs indicated that the use TeachLivETM seemed realistic and provided good experience for interacting with ELs. Only two TCs indicated that their overall experience with the simulated classroom was negative.

Theme 2: TCs Overcoming Communication Barriers While Questioning Beginner Level ELs

The TCs’ positive experiences with TeachLivETM translated into learning about formulating questions for beginner level ELs, as supported by the evidence from the analysis of question types. As shown in Table 4, the TCs’ use of question types that were appropriate for beginner ELs increased from Round 1 to Round 2 with the use of yes/no and either/or question types. Additionally, questions using interrogative expressions that require a lengthier response, and are typically more appropriate for intermediate level ELs, decreased from Round 1 to Round 2.

Table 4

<table>
<thead>
<tr>
<th>Types of Questions Asked by TCs to Beginner Level ELs</th>
<th>Question Type</th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes/No</td>
<td>52</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Either/Or</td>
<td>11</td>
<td>40</td>
</tr>
</tbody>
</table>
Relating the challenges that the TCs faced in preparing questions specifically for beginner level ELs, only one TC expressed that she had difficulty. After the interaction with the simulation classroom, 44 candidates reported challenges in asking their questions to the EL avatars. Six TCs specifically addressed the challenges that they had when interacting with the beginning level EL avatar but stated that they overcame these difficulties. Others noted growth in their self-awareness for their own delivery of the questions with the beginner EL. In other words, the TCs were acutely aware of their rate of speech, the amount of words they used when asking the questions, and the gestures that were used when trying to convey their question to the EL avatars. As one TC stated, “I did have trouble with the questions that I asked. With [the EL avatar with a beginning proficiency], I had to use gestures, revise my question, and even point to the answer and repeat myself.”

Theme 3: TCs’ Overgeneralization of Beginner Level Questioning Strategies for Intermediate and Advanced Level ELs

Despite the increase in appropriate beginner level questions, the majority of the TCs experienced challenges in writing appropriate questions to ask intermediate and advanced ELs. In examining the question types that were written for intermediate level ELs, questions with interrogative expressions remained relatively constant from Round 1 to Round 2 and the use of progressive tenses decreased. Question types that are appropriate for beginner ELs (e.g., yes/no, either/or questions) increased from Round 1 to Round 2 when asked to the intermediate EL avatar. Table 5 shows the types of questions asked by the TCs at the intermediate level.

Table 5
Types of Questions Asked by TCs to Intermediate Level ELs

<table>
<thead>
<tr>
<th>Question Type</th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/No (appropriate for beginner)</td>
<td>19</td>
<td>41</td>
</tr>
<tr>
<td>Either/Or (appropriate for beginner)</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>Interrogative</td>
<td>67</td>
<td>64</td>
</tr>
<tr>
<td>Progressive tenses</td>
<td>52</td>
<td>30</td>
</tr>
</tbody>
</table>

Additionally, the types of questions that are appropriate for advanced ELs changed little from Round 1 to Round 2. The use of hypothetical situations and the conditional tense increased by ten questions; whereas, the use of complex sentence structures decreased. Again, the use of beginner level questions (e.g., yes/no) and intermediate level questions (e.g., interrogative) increased when the advanced EL was questioned by the TCs. Table 6 shows the types of questions asked by the TCs at the advanced level.

Table 6

Types of Questions Asked by TCs to Advanced Level ELs

<table>
<thead>
<tr>
<th>Question Type</th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/No (appropriate for beginner)</td>
<td>36</td>
<td>70</td>
</tr>
<tr>
<td>Interrogative (appropriate for intermediate)</td>
<td>99</td>
<td>110</td>
</tr>
<tr>
<td>Hypothetical/conditional</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Complex sentence structure</td>
<td>11</td>
<td>0</td>
</tr>
</tbody>
</table>

When analyzing the TCs’ responses from the questionnaire, two patterns emerged. First, 57 TCs stated that they struggled with writing questions appropriate for all three levels; however, a closer analysis of these responses showed that the TCs had particular difficulty differentiating what was appropriate to ask intermediate and advanced level. One TC stated, “My main challenge was with [the] intermediate level because I asked questions that would be either too easy or too difficult for them to understand.” The second pattern that emerged within Theme 3 highlighted the TCs’ anticipation for how the EL avatars would respond to
the TCs’ questions.

Theme 4: TCs’ Use of Filler Language

The fourth theme shows a reduction in questions that contained a great deal of excessive language, which we call filler language, from Round 1 to Round 2. Filler language can obstruct or distract from the negotiation of meaning with ELs due to the amount of unnecessary words used to ask a question. For example, a more direct approach to ask the question, “Can you tell what the boy is doing in this picture?” would be, “What is the boy doing?”

Table 7 reveals that the amount of questions containing filler language used in Round 1 greatly decreased in Round 2. The frequency distribution reflected from the table represents the TCs’ initial written questions that were created prior to their interactions with the EL avatars (i.e., Round 1) and their revised questions after the simulation (i.e., Round 2).

Table 7

<table>
<thead>
<tr>
<th>TCs’ Questions Containing Filler Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Beginner</td>
</tr>
<tr>
<td>Intermediate</td>
</tr>
<tr>
<td>Advanced</td>
</tr>
</tbody>
</table>

When questioning the intermediate EL avatar, TCs the reduced the amount of filler language from Round 1 to Round 2; however, the majority of the TCs’ responses from the questionnaire regarding filler language were about their interactions with the beginner EL avatar, as highlighted in Theme 1. A summary of this commentary indicated that “rewording” the questions asked to the beginner EL avatar during the simulation helped the
Discussion

The study’s findings show that the TCs described the Teachlive experience as useful and realistic. As a result of the TeachLivE™ experience, the TCs’ questioning strategies for ELs evolved from the two rounds of questions. The findings show that TCs increased the total number of questions appropriate for beginner level ELs from Round 1 to Round 2. Also, TCs showed a decrease in their use of filler language in questioning ELs of all levels. However, the trend in the majority of TCs’ questions showed a decrease in the total number of questions appropriate for intermediate and advanced level ELs between the two rounds of questions.

The TCs improved in their ability to make their questions more comprehensible for beginner ELs as a result of the TeachLivE™ experience. With respect to all three English proficiency levels, this is a notable finding as previous research (Durgunoğlu & Hughes, 2010; McGraner & Saenz, 2009) indicated that the majority of teacher preparation programs fail to provide adequate preparation in teaching ELs of all English proficiency levels. The TCs’ from this study reported their struggles in communicating with the beginner EL avatar.

However, during the classroom simulation the TCs improved their questions for beginner ELs by using TeachLivE™. Furthermore, the number of questions TCs asked the beginner EL avatar that were more appropriate for a higher level of proficiency (i.e., intermediate and advanced) decreased from 92 in Round 1 to 40 in Round 2. The TCs also became more aware of their excessive wording and realized the importance of slowed speech, incorporating gestures, and relevant visuals to scaffold their questioning. The TCs were able
to use the strategies presented in their ESOL methods course to adjust their questions to be more comprehensible for beginner ELs during the classroom simulation, even when the questions they had originally prepared in the first round were not appropriate for a beginner EL.

However, the learning gains TCs made in questioning beginner level ELs did not extend to higher proficiency levels. It became evident that the TCs adjusted their questioning techniques so that all questions were more appropriate for beginning ELs. As previous research has shown, the TCs overextended what was appropriate for the beginning ELs to both the intermediate and advanced ELs (Albergaria-Almeida, 2010; Ellis, 2008). Furthermore, the TCs found it challenging to distinguish the level of complexity in writing the questions between the intermediate and advanced ELs. Fifty-seven TCs noted in the questionnaire that the TeachLivE™ experience raised their awareness of the importance of differentiating their questioning strategies for ELs so that questions were comprehensible, yet appropriately challenging. Moving forward, TCs realized the obvious need for asking questions that are appropriate for each level of English proficiency, something that they may not have considered prior to this workshop.

This experience substantiates the importance of offering TCs opportunities such as TeachLivE™ experiences. The TCs reported their attempts to negotiate meaning with the EL avatars. In fact, the TCs changed their questioning strategies and provided the necessary assistance to move the beginner EL beyond their actual level of performance to another potential level of answering questions. Additionally, it must be noted that the TeachLivE™ experience took place in the presence of classmates and the instructor who coached the TCs when they struggled in their attempts to negotiate meaning. As one TC mentioned above,
watching and listening to peers adjust their questions as they interacted with the EL avatars scaffolded the other TCs in attendance.

**Conclusion and Implications**

The results of this study highlighted the necessity of teacher preparation programs to provide more focused instruction in asking questions appropriate for ELs at various levels of English proficiency. It is not enough to address EL accommodations as a “one size fits all” approach. In order to address the type of scaffolding necessary for TCs to comfortably navigate various proficiency levels, two considerations must be considered. First, explicit instruction is necessary to show TCs how to modify input for beginner ELs and reduce unnecessary wording without simplifying the both the question and its content. Furthermore, TCs need scenarios where they can provide intermediate and advanced ELs more complex input that supports the ELs’ expanded output. Secondly, TCs must have hands-on experiences in providing comprehensible input to ELs of various levels. This could occur with experiences such as TeachLivE™, or carefully guided field experiences.

The findings of this study show that TCs became aware of the need for skill in asking questions to ELs at beginning, intermediate, and advanced levels of English proficiency. Clearly, TCs need to know how to effectively ask questions to ELs at each proficiency level. Candidates’ responses indicated their understanding that effective teachers of ELs scaffold their students’ learning and language acquisition by continually re-assessing their ELs’ linguistic and academic progress. The classroom simulation proved beneficial to the TCs in their practice of asking appropriate questions to ELs, which overall assists TCs in their preparation of meeting the needs of ELs. Likewise, the TCs realized the importance of
re-assessing their own approach (e.g., wording, rate of speech, gestures) when asking ELs comprehensive questions. The implications of these findings suggest highly that pointed, specific instruction, practice, modeling, scaffolding, and differentiating questioning are instructional practices that are beneficial for programs training TCs to work with ELs in PreK-12 school settings.
References


Author, 2001 [details removed for peer review].

Aydemir Y, & Çiftçi Ö. (2008). Literature Teachers' Questioning Skills: A Study on (Gazi University Faculty of Education Case), *Centenary University J. Faculty Education, 6*(2), 103-115.


Pre-service elementary mathematics teachers’ (PEMT) perceptions and beliefs towards the use of technologies can be shaped if they are integrated as part of the preparation program, linked to the practice, and presented as a tool with multiple benefits (Gordon, Brayshaw, & Grey, 2015; Russell, Bebell, O’Dwyer & O’Connor, 2003). The current report is intended to present preliminary results of an ongoing study in which PEMTs were exposed to the use of Mixed-Reality Simulations (MRSs) during a mathematics methods course. The research question for the study is: What are the PEMTs’ perceptions and beliefs toward the use of MRSs as part of their teacher preparation? PEMTs’ responses were captured through an instrument used for this purpose, and where preliminary analysis shows that the PEMTs not only enjoy the use of MRSs but that the use of MRSs enhanced their teaching skills in high leverage practices like eliciting and questioning.

**Keywords:** Technology, Beliefs, Instructional-Activities

**Introduction**

Pre-service teacher’s perception on how technology can be used and implemented in the classroom, or how technology can help them acquire new knowledge and teaching skills, can be influenced if technologies are integrated as part of the preparation program, linked to the practice, and presented as a tool with multiple benefits (Gordon, Brayshaw, & Grey, 2015; Russell, Bebell, O’Dwyer & O’Connor, 2003). In particular, if technologies like Mixed-Reality Simulations (MRSs) are integrated in methods courses in which high leverage practices [HLP] (Ball, & Forzani, 2011) are fostered. MRSs software like TLE TeachLiveTM/Mursion™ (Andreasen & Haciomeroglu, 2009) are tools intended to provide teachers and pre-service teachers early experiences that would enhance and strength their teaching skills, while
interacting in a safe environment (Hixon & So, 2009). MRSs are not intended to be used to replace the real-life experience of pre-service teachers with students, but rather to help them be ready and better prepared for their teaching responsibilities. According to Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes (2014), MRSs have the potential of “improving [and affect] teacher education” (p. 24) by supporting the learning and use of technologies, and offering a safe environment where to rehearsal possible real future experiences.

The report presented here is intended to depict preliminary results of an ongoing study in which pre-service elementary mathematics teachers (PEMTs) were exposed to the use of MRSs during a mathematics methods course. The use of MRSs with the PEMTs have the intention of fostering HLPs related to the use of productive mathematical talk moves [PMTM] (Chapin, O’Connor, & Anderson, 2009; Moyer & Milewicz, 2002; Ginsburg, 1997) for eliciting, assessing, and questioning elementary students while solving mathematical tasks. To this end, the researcher is looking to answer the following question: What are the PEMTs’ perceptions and beliefs toward the use of MRSs as part of their teacher preparation? PEMTs’ responses were captured through an instrument used for this purpose, and where preliminary analysis shows that the PEMTs not only enjoyed the use of MRSs as part of the math methods course, but that they perceive MRSs as a tool that helped them to boost their teaching skills in eliciting the student’s thought and promoting discourse. In addition, the PEMTs mentioned that they would like to continue using the MRS to foster and improve their skills in other courses of the teacher preparation program.

**Theoretical perspectives**

In education, the implementation of technologies has evolved to the point in which teachers are now exposed to its uses as part of their preparation (Birkollu, Yucesoy, Baglama, & Kanbul, 2017), and as a tool to enhances their teaching skills (Rakhimova, 2016). The
integration of technologies in the teaching-learning process of pre-service teachers is now as important as the content and pedagogy knowledge (Stobaugh & Tassell, 2011). Similar to how technologies are integrated in the classroom to increase the student’s learning acquisition, teachers’ preparation programs must engage pre-service teachers in the use of technologies that enhance their experience, develop their skills, and motivate them to see technologies as tools that not only serve for social communication, but that potentialize the knowledge acquisition (Dieker et al., 2014; Niess, 2005).

Pre-service teachers recognize that presently, technologies are important, however, this does not reflect an understanding of its benefits or how technology can be used, implemented, and integrated as part of their preparation as future teachers (Kelly-McHale, 2013). Further, variables like self-efficacy, belief, and culture can also affect how technology is perceived and accepted (Nishino, 2012). For pre-service teachers to really acquire the theoretical understandings of the benefits of using technologies, their perspectives and beliefs must be shaped on what Venkatesh, Morris, Davis, & Davis (2003) has called the theory of acceptance and use of technology. This theory establishes that four main aspects determine acceptance in use of technology: The performance expectancy, effort expectancy, social influence, and the facilitating conditions. According to Venkatesh et al., pre-service teachers’ perceptions on the use of technology can be significantly persuade when these four aspects are well addressed in preparation programs.

Teachers and pre-service teachers are normally familiar to the commonly operating systems and software like Microsoft Work, Power Point, Excel, and Windows, or in some instances to take interactive television (ITV) courses and to communicate asynchronous with the use of emails, or discussion boards (Shoffner, 2009), however, they have not been much exposed to the use and practice of emerging technologies like TeachLivETM (Andreasen & Haciomeroglu, 2009), for which simulations allow pre-service teachers—or any participant—to
have “repeated trials involving high stakes situations without risking the loss of valuable resources” (Dieker et al., 2014, p.22)

Techlive is a Mixed-Reality Simulation (MRS) software that is used to provide pre-service teachers the opportunity of experiencing teaching related practices in a safe simulated environment, particularly—but not limited—during the first year of the teachers’ preparation program in which in many instances pre-service teachers have few teaching opportunities. MRSs is portrayed as a tool that can provide pre-service teachers opportunities to practice various instructional strategies in a variety of environments, develop skills in providing feedback, integrate technology, and practice teaching content related concepts (Hixon & So, 2009). MRSs then serves as a technological tool that is intended for the pre-service teacher to develop high leverage practices skills (Cohen, 2015) such how to assess and elicit their students’ thoughts (Hatton, Birchfield, & Megowan-Romanowicz, 2008). One important aspect of simulated environments is that they must provide the pre-service teacher—or participant—with a sense of reality in which there is a “real present”. Dieker et al., defined “real present” as the perception that something real is happening. For example, it is not the same to read about how to elicit a students’ thought than having a discourse in the classroom and asking questions. The above is relevant to shape the pre-service teachers’ perception on the benefits of the use and implementation of MRSs as part of the preparation program.

**Methodology and Data Collection**

The preliminary results of the research project presented here is part of an ongoing larger study in which MRSs technologies are used to help develop high leverage practices (Ball & Forzani, 2011) with pre-service elementary mathematics teachers. This larger study was designed to examine the PEMT’s productive mathematical talk moves when conducting a clinical interview. The researchers’ report is intended to present only preliminary results of the
perceptions and beliefs that the PEMTs have when they are exposed to the MRSs. For the purpose of providing the reader with an overview of the whole study, in the following paragraphs the researchers explain the context in which the PEMTs were trained with the MRSs.

Participants were thirty-four ($N=34$) PEMTs taking a mathematics methods course during the Fall 2018 from which 31 were females and 3 males. All the participants were in their first year of the teaching preparation program at a minority serving institution deep south USA. The PEMTs were required—as part of the course assignment—to conduct a clinical interview with an elementary student to assess and elicit the students’ understanding when solving a mathematical task. To this end, the PEMTs were exposed to rehearsals, readings, videos, and lectures in class, and asked to have three MRSs sessions. Each MRS session lasted between 7 and 12 minutes and was video recorded. In every session the PEMTs were required to implement a different given mathematical task. The MRSs sessions were distributed through the whole semester with one month apart in other to ensure that the theoretical and pedagogical concepts were covered in class. Subsequently, after each MRS session the PEMTs were required to submit a one-page self-reflection and provide a peer-feedback constructive critic of the MRSs videos within their small working-teams. The teams were randomly formed with three to four members, and their feedbacks were asked to be submitted though an online platform used for this purpose.

After the PEMTs conducted their clinical interview, they were required to submit the audios, transcripts, and artifacts of the interview. Lastly, the PEMTs were asked to answer a questionnaire—which is the main focus of this report—about their perceptions and belief toward the used of MRS as part of their teaching training. The instrument used to measure the PEMTs perceptions and beliefs was adapted from Hudson, Voytecki, & Zhang, (2018), Bousfield, (2017), and Rasimah, Ahmad, & Zaman, (2011), and tailored to meet the researcher’s purpose and needs. It comprises 27 questions in a Likert-scale type ranging from strongly agree...
to strongly disagree. For the purpose of this brief report, preliminary results of only ten questions are discussed.

**Findings and discussion**

Pre-service elementary mathematics teachers were asked to answer a questionnaire with the intention of measuring their perceptions and beliefs when exposed to the use of MRSs as part of their first-year teaching preparation program. Because of the small sample ($N=34$) in this first phase of the study, only percentages and discussion of the responses are presented (See table 1).

**Table 1: Participants’ responses by question**

<table>
<thead>
<tr>
<th>Questions</th>
<th>$N$</th>
<th>Agree (%)</th>
<th>Strongly Agree (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel that using Mixed-Reality Simulations enhanced my learning experience.</td>
<td>34</td>
<td>38</td>
<td>59</td>
<td>91</td>
</tr>
<tr>
<td>Using the Mixed-Reality Simulation is an effective way to practice new classroom skills.</td>
<td>34</td>
<td>29</td>
<td>68</td>
<td>97</td>
</tr>
<tr>
<td>After practicing my teaching methods using Mixed-Reality Simulations, I am more confident that I can effectively teach mathematics concepts.</td>
<td>34</td>
<td>47</td>
<td>47</td>
<td>94</td>
</tr>
<tr>
<td>After the MRS, I feel prepared to conduct a clinical interview to assess and elicit students thoughts and understanding using mathematics productive talk moves.</td>
<td>34</td>
<td>44</td>
<td>44</td>
<td>88</td>
</tr>
<tr>
<td>After my Mixed-Reality Simulation sessions, I have more confidence that I can engage students in a discourse about problem-solving activities.</td>
<td>34</td>
<td>38</td>
<td>56</td>
<td>94</td>
</tr>
<tr>
<td>After my Mixed-Reality Simulation sessions, I am better prepared to teach lessons involving problem solving. The Mixed-Reality Simulation rehearsals helped me to create a plan for the clinical interview with an elementary student.</td>
<td>34</td>
<td>44</td>
<td>53</td>
<td>97</td>
</tr>
<tr>
<td>I would like to use Mixed-Reality Simulation to develop my teaching skills in other courses.</td>
<td>34</td>
<td>41</td>
<td>53</td>
<td>94</td>
</tr>
<tr>
<td>I enjoy rehearsing with Mixed-Reality Simulations.</td>
<td>34</td>
<td>32</td>
<td>65</td>
<td>97</td>
</tr>
<tr>
<td>My Mixed-Reality Simulation session seemed like a real classroom experience.</td>
<td>34</td>
<td>50</td>
<td>44</td>
<td>94</td>
</tr>
</tbody>
</table>
During the first years of the teaching preparation programs, many PEMTs are barely exposed to well structured, engaged teaching experiences (Freeman, 2010), instead, they are only required to conduct field-observation hours. With the use of the MRSs, the PEMTs can engage in virtual classroom settings that models real classrooms. In this regard, ninety-four percent of the PEMTs agree or strongly agree that MRSs sessions seemed like a real classroom experience, and ninety-seven percent expressed that they enjoy rehearsing with the MRSs.

The use of MRSs in a teacher preparation program is not intended to displace the real-experience, but rather to enhance the PEMTs’ preparation experience (Peterson-Ahmad, 2018), in a safe environment (Hatton, Birchfield, & Megowan-Romanowicz, 2008). The participants on the study acknowledge the above, for which ninety-seven percent agree or strongly agree that using MRSs is an effective way to practice new classroom skills, particularly in mathematics for which ninety-four and ninety-seven percent respectively, expressed either feeling more confident to effectively teach mathematics, or to prepare to engage their students in lessons that involve discourse about problem-solving activities. Similarly, eighty-eight percent of the responders agree or strongly agree that after been exposed to the MRSs they feel prepared to conduct a clinical interview to assess and elicit their students’ thoughts and understanding using PMTMs.

As mentioned in the methods section, the PEMTs were exposed to several different instructional strategies (e.g., lectures, videos, rehearsals, readings’ discussions), and a set of 3 MRSs sessions. All these helped the PEMTs acquire the teaching skills they need for their future responsibilities and be ready for one of the major assignments in the course: The clinical interview with an elementary student. In this regard, ninety-four percent of the PEMTs agree or strongly agree that their interaction with the MRSs helped them to create a plan for the clinical interview, increasing and improving their experience.

In the end, the PEMTs recognized the benefit of been exposed to a state-of-the-art technology that serve as a tool to improve, increase, and enhance the acquisition of high leverage practices
(Ball & Forzani, 2011). In fact, ninety-seven percent of the PEMTs agree or strongly agree with the above, and ninety-four percent of them would like to continue using MRSs in other courses as part of their teaching preparation program.

**Conclusions and Limitations**

Teachers are in constant pressure to deliver a good quality instruction to their students (Hénard & Roseveare, 2012). In addition, teachers’ performance is measured based on their students’ achievement (Sawchuk, 2015) — as measured by scores in standardized tests (Popham, 2001). Therefore, how teachers are prepared is extremely relevant, since it is during this time when they acquire the skills and knowledge for their future endeavor. Then, teacher preparation programs must incorporate innovative strategies from the first day of the preparation program.

The use of MRSs in the first year of the teachers’ preparation program, particularly in a math method course, is an innovative way to enhance the PEMTs’ preparation, and although a bigger sample is needed in order to make a generalization—which represent a limitation—the responders for this first phase of the study showed that they perceived the MRSs as a useful tool, that helped them to improve their teaching skills—particularly in regard to eliciting and questioning students in a clinical setting or classroom discourse— and that they would like to use it in other courses during their preparation program. The well guided and planed use of technology (Venkatesh et al., 2003)—as the MRSs is implemented here—helped the PEMTs perceive the MRSs as a tool intended to enhance their HLPs (Ball & Forzani, 2011) skills, and not to substitute the real experience, which is a common limitation for first year pre-service teachers, when only field observations are required.

The preliminary results presented here are only the first phase of an ongoing larger study that involve the analysis of the PEMTs transcripts once they have conducted a clinical interview. The results of this study will be presented in another report, meanwhile, more data is continuing to be collected about the PEMTs’ perceptions and beliefs on the use of MRSs as part of their teacher preparation, which is intended to be analyzed and presented in this forum in a near future.
References


Preparing Future School Leaders: Building Generative Thinking Skills Via Mixed Reality Experiences

Marjorie Ceballos and Krista Bixler

Author Note

Marjorie Ceballos, Assistant Professor, Department of Educational Leadership and Higher Education, University of Central Florida. Krista Bixler, Principal, Orange County Public Schools, Orlando, Florida.

Correspondence concerning this conference proceeding should be addressed to Marjorie Ceballos and Krista Bixler, Department of Educational Leadership and Higher Education, University of Central Florida, Orlando, Florida, 32801. Emails: marjorie.ceballos@ucf.edu; krista.bixler@ucf.edu
ABSTRACT

The study sought to gain an understanding of how future school leaders conduct a post-conference, focusing on students’ ability to engage the avatar (teacher) in generative thinking. Within a generative thinking framework, M.Ed. students are encouraged to conduct post-conferences from an inquiry stance by “asking generative questions or making generative statements that lead to new thinking and self-efficacy” (Taylor & Chanter, 2016, p. 38). Data for the study were collected through fieldnotes during the students’ mixed reality experiences. To analyze the qualitative data gathered from the fieldnotes, the constructs of (a) rapport, (b) structuring, (c) inquiry, (d) accuracy checks, (e) summarizing, (f) data and evidence, and (g) next steps were identified using the work of Taylor and Chanter (2016) and Nolan and Hoover (2011). Further qualitative analysis of the constructs using the constant comparative method (Glaser & Strauss, 2008) yielded three dominant themes: (a) personalizing, (b) sequencing, and (c) generative thinking through inquiry. These themes represented opportunities M.Ed. students had to engage the avatar (teacher) in generative thinking (Taylor & Chanter, 2016).
Background

Principals impact student achievement in two discrete ways: (a) through reflective practices with teachers and (b) by providing feedback about teacher classroom behaviors (Range, Scherz, Holt, & Young, 2011). New principals are charged with the task of building capacity in teachers to improve their schools (Young, 2013). School leaders who are able to lead teachers in analyzing their impact on student achievement have an effect size of $d = 0.91$ (Hattie, 2014) with $d = 0.40$ being an effect size to positively impact student learning (Taylor & Chanter, 2016). One way principals can lead teachers through analyzing their impact on student achievement is through generative thinking: reflection leading to deliberate changes in instructional performance (Taylor & Chanter, 2016). When coaching and supervision are combined appropriately by school leaders, 90% of teachers are able to transfer their learning to classroom practice (Nolan & Hoover, 2011). However, when coaching and supervision are not combined in this way only 15% to 20% of teachers are able to transfer their learning to classroom practice (Nolan & Hoover, 2011). Therefore, the goal of supervision and coaching is to develop the reflective practice in teachers to lead them to continuous improvement even when the principal is not there (Taylor & Chanter, 2016). It is within this context that the authors sought to determine how future school leaders approach a post-observation conference that results in generative thinking by an avatar in a mixed-reality experience, where the avatar is in the personae of a teacher. This study was undergirded by the following research question:

How do future school leaders approach a post-conference mixed reality experience to build teacher’s generative thinking skills?
Methods

Context of the Study

As part of the master’s in educational leadership, students engage in a mixed-reality experience where they provide feedback to an avatar in a post-observation conference. The mixed reality experience is a part of a supervisory course in the educational leadership program. Prior to participating in the mixed reality experience, students are provided four written scenarios, describing observed teacher practices (Taylor & Buckridge, 2014). At the time of the mixed reality experience, participants are assigned one of the four scenarios at random. Participants are then given up to 10 minutes to engage in the interaction. Immediately following the interaction, participants are provided feedback by the authors of this paper on their performance during the interaction.

Participants

Participants in this study consisted of students in a supervision course who engaged in a mixed reality experience where they provided feedback to a teacher in a post-observation conference. The mixed reality experience is part of the coursework in the supervision course. There was a total of 19 participants in the mixed reality experience. The participants were either classroom teachers \((n = 11)\), instructional coaches \((n = 5)\) or had other positions within a school district \((n = 3)\).

Data Sources and Analysis

The data sources for this study consisted of two sets ethnographic field notes (Emerson, Fretz, & Shaw, 2011), compiled individually by the authors during the participants’ mixed reality
experiences. The field notes consisted of statements or questions made verbatim by the participants during the mixed reality experience. Moreover, the researchers also summarized actions taken by each of the participants during the interactions. Lastly, the researchers wrote brief reflections at the completion of each interaction to ensure researchers’ initial analysis on each interaction was recorded.

**Explicit Coding for Constructs and Emergence of Themes**

Field notes were explicitly coded by each researcher individually for the constructs of (a) rapport, (b) structuring, (c) inquiry, (d) accuracy checks, (e) summarizing, (f) data and evidence, and (g) next steps (Nolan & Hoover, 2011; Taylor & Chanter, 2016). Following the individual coding, the researchers then compared their explicitly-coded field notes and then recoded the explicit codes as needed to ensure inter-coder agreement and reliability. Following the explicit coding, the researchers analyzed the explicitly-coded data quantitatively to gain an understanding of the constructs participants utilized during the interaction. Then, using the authors’ reflections and the quantitative data generated from the anecdotal notes, participants were tiered into three groups.

Tier 1 participants \((n = 3)\) were those participants who had completed the mixed-reality experience by generating a consensus with the teacher on an instructional improvement and identified specific next steps, while maintaining a positive rapport with the avatar. Tier 2 participants \((n = 5)\) were those who completed the mixed reality experience by establishing the instructional improvement for the avatar and agreeing to next steps, while maintaining a positive rapport with the avatar. Tier 3 participants \((n = 11)\) were those who completed the mixed reality experience by establishing the instructional improvement and next steps for the avatar, while also
not being able to maintain a positive rapport with the avatar. The constant comparative method (Glaser & Strauss, 2008) was utilized to compare incidents within constructs and among tiers and to combine constructs, leading to an emerging theory of the manner in which future school leaders approach a post-conference mixed reality interaction. Analysis of how each group tier utilized the constructs yielded three overarching themes: (a) personalizing, (b) sequencing, and (c) generative thinking through inquiry. The theme of personalizing was comprised of the constructs of rapport and accuracy checks. Sequencing was comprised of the constructs structuring and summarizing. Generative thinking was comprised of inquiry, data and evidence, and next steps.

**Findings**

In our study, Tier 1 participants utilized fewer constructs ($M = 13.3$) than both Tier 2 ($M = 13.8$) and Tier 3 participants ($M = 16.6$) in the post-observation conference. Analysis of the constructs utilized by tiered groups demonstrated that Tier 1 utilized the seven contracts evenly during the interaction. Tier 2, however, focused more heavily on inquiry (31.5%) and data and evidence (24.1%). Similarly, Tier 3 also focused on data and evidence (25.7%) and inquiry (19.1%).

Each tier utilized the themes of personalizing, sequencing, and generative thinking through inquiry differently. When personalizing, Tier 1 used accuracy checks to build upon the construct of rapport, continuously focusing on the observed instruction. Tier 2 used personalizing to validate the avatar’s personal feelings about the instruction, rather than focusing on the observed instruction. Tier 3 used personalizing to validate their own perspective on the avatar’s perceived inadequacies during instruction.
When sequencing, Tier 1 participant’s blended structuring and summarizing to move the conference toward generative thinking, continuously focusing on the goal of the observed lesson. Tier 3 participants used summarizing to describe the avatar’s instructional deficiencies and used structuring questions to move the conference toward addressing the avatar’s deficiencies.

When engaging teachers in generative thinking through inquiry, Tier 1 participants used data and evidence to inform the line of inquiry during the post-observation conference to generate the instructional improvements that were grounded in the avatar’s current practice. Tier 2 used generative thinking through inquiry with the purpose of building the background for the participant’s preferred instructional improvements, not necessarily focused on the avatar’s current practice. Lastly, Tier 3 participants did not use data and evidence to inform the line of inquiry. Inquiry was used to clarify the participants’ own perspectives on the observed instruction. Further, Tier 3 participants presented multiple instructional strategies not related to the avatar’s current practice and without explanation.

Discussion and Implications

Initial findings from this study can be used to inform instruction in supervisory courses in educational leadership programs. First, educational leadership faculty may provide students with a clear understanding of each of the constructs (e.g., rapport, structuring, inquiry, accuracy checks, summarizing, data and evidence, and next steps) is used to promote generative thinking in teachers (Nolan & Hoover, 2011; Taylor & Chanter, 2016). Educational leadership faculty may help students to understand that in post-observation conferences, using fewer, effectively-blended constructs is optimal.
Next, educational leadership faculty may provide instruction to students on how to blend the constructs so that students are *personalizing*, *sequencing*, and *promoting generative thinking through inquiry* efficiently as they engage in a post-observation conference with teachers. When *personalizing*, a post-observation conference, future school leaders should focus on the observed instruction and not on specific teacher actions. By focusing on the observed instruction, objectivity will be maintained during the post-observation conference, leading to generative thinking. In terms of *sequencing* in a post-observation conference, future school leaders should again focus on observed instruction and not on specific teacher actions. Furthermore, sequencing should be used to further generative thinking on the part of the teacher and not to dictate teacher behaviors. Lastly, when engaging a teacher in *generative thinking through inquiry*, future school leaders should focus on using a teacher’s current instructional practice to generate instructional improvements collaboratively in an objective manner for sustainability and growth. Next steps should support the instructional improvements generated.

**Conclusion**

Teacher supervision is perhaps the most essential task for which school leaders are responsible. In educational leader preparation programs across the United States, future school leaders are provided instruction and practical experiences to engage in teacher supervision. This study sought to understand how future school leaders conduct a post-observation conference that culminates in a teacher engaging in generative thinking to identify instructional improvements. Findings from this study may inform instruction in educational leadership programs to ensure future school leaders are helping teachers generate instructional improvement rather than the supervisor providing the improvements to the teacher. This is imperative for sustainability within a school, so teachers can engage in this process on their own continuously.
References


Developing Students’ Communication Skills through Virtual Role Play Activities
Christine Wilson, EdD

East Carolina University

ABSTRACT
Employers have reported difficulty in finding employees who possess the skills needed to be successful because students are entering careers with degrees that provided them with the knowledge required for their chosen fields but without the interpersonal skills necessary to be successful. By incorporating active learning, such as virtual role play within programs like Mursion—an immersive simulation tool that includes avatars with whom students can interact in a variety of situations and environments, students experience real-life situations to learn and practice situations they will encounter once they enter the workforce. Mursion is. In this study, Mursion provided opportunities for students to practice interpersonal skills in realistic situations they are likely to face in real life. The results of the study indicated that students’ perceived benefit in their communication skills and reported they felt more confident going into similar situations after interacting with Mursion.

Statement of the Problem
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). 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, Salleh, Baharom, & Memon, 2017). This produces graduates with a theory-practice gap that needs to bridged (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 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). 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).

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, 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. 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.
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 can discuss their experiences with peers and mentors.

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 (Economic Graph Forum, 2018). This change to focusing on less discipline-specific skills 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 whom 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 for both traditionally identified for a particular field and for jobs that may not exist yet so they can be successful. 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, and 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.

**Purpose of the Study**
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. 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.

**Literature Review**
The Great Recession ended in 2009, yet in 2014, when the Department of Labor Statistics first posted experiential 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 can 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 section 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. It 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 was 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 gives an overview of communication skills but also takes a closer look at interpersonal communication skills, specifically how those skills apply in this study. Finally, the Mursion® discussion introduces Mursion® and its history. It also provides 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 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.”

**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). When engaging in role play in a virtual simulation, students have found that the experience allows them 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.

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.

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.

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 essential 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).

**Virtual Simulation vs. Traditional Role Play -- Mursion®**

An essential 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. 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.

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. 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.

Mursion® is designed to provide participants the opportunity to immerse themselves in the learning event, rather than merely observe them. 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). 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 (Chini, Straub, & Thomas, 2016; Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2014).

**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.
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?

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).

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**

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 1, 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 four 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 2). 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 2). 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 2). The participants were broken down into primary

Table 1

<table>
<thead>
<tr>
<th>Study Step</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-ICCS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mursion® Session 1</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Debriefing Questions Interview</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Interpersonal Communication Short Survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mursion® Session 2</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Interpersonal Communication Short Survey</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Mursion® Session 3</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Post-ICCS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Final Feedback Survey</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

*Note. “X” shows included steps.*

Table 2

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Group A</th>
<th>Group B</th>
<th>Group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Males: 9</td>
<td>Male: 3</td>
<td>Males: 19</td>
</tr>
<tr>
<td></td>
<td>Females: 31</td>
<td>Female: 24</td>
<td>Females: 20</td>
</tr>
<tr>
<td>Major</td>
<td>Biology: 4</td>
<td>Audiology: 6</td>
<td>Accounting: 1</td>
</tr>
<tr>
<td></td>
<td>Communications: 3</td>
<td>Did not disclose: 2</td>
<td>Biology: 1</td>
</tr>
<tr>
<td></td>
<td>Criminal Justice: 1</td>
<td></td>
<td>Business: 5</td>
</tr>
<tr>
<td></td>
<td>Education: 1</td>
<td></td>
<td>Communications: 3</td>
</tr>
<tr>
<td></td>
<td>Exercise Physiology/Science: 10</td>
<td></td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>Finance: 1</td>
<td></td>
<td>Management: 1</td>
</tr>
<tr>
<td></td>
<td>Marketing: 1</td>
<td></td>
<td>Engineering: 2</td>
</tr>
<tr>
<td></td>
<td>Nursing: 2</td>
<td></td>
<td>Exercise Physiology: 1</td>
</tr>
<tr>
<td></td>
<td>Nutrition: 1</td>
<td></td>
<td>Finance: 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Geography: 1</td>
</tr>
</tbody>
</table>
Psychology: 1  
Sports Studies: 1  
Undecided: 6  
Did not disclose: 2  
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  
| 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.

**Type of Research Design**

This mixed-methodology study provided a more complete understanding than a single methodological approach would afford (Creswell, 2014). 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). Before 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 1 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 after their Mursion® treatment(s) (Post-ICCS). 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 ten items. It is rated on a 5-point range (Rubin & Martin, 1994). 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 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 experience. 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).

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.

Quantitative Results
Initial codes were identified in the pilot data by reading through the interview transcripts and manually looking for common themes, such as ‘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. 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. 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 demographic differences.

The data was analyzed quantitatively within each 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. Table 3 shows these results and are discussed in 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)**

**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 Table 3. Also shown in Table 3 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 seen 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 Table 3. 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 2 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 the 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 A provides information on what the athletes comprising Group D liked most and least about their Mursion® experience. As shown in Appendix A, 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.
Figure 2. Group D results from the Final Feedback Survey regarding satisfaction.
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 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 Table 3, 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 significant 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 is evident in Table 3 and Figures 1 and 2, 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 dissatisfied, and
11% reported being slightly dissatisfied (see Figure 1). 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.

Table 3

Means and Standard Deviation for Each Survey Divided by Group

<table>
<thead>
<tr>
<th></th>
<th>Group B</th>
<th></th>
<th>Group D</th>
<th></th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Self-disclosure</td>
<td>4.02</td>
<td>0.785</td>
<td>3.90</td>
<td>0.86</td>
<td>4.03</td>
</tr>
<tr>
<td>Pre-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.743</td>
</tr>
<tr>
<td>Self-disclosure</td>
<td>3.79</td>
<td>0.819</td>
<td>4.03</td>
<td>0.707</td>
<td></td>
</tr>
<tr>
<td>Mid-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-disclosure</td>
<td>3.90</td>
<td>0.934</td>
<td>4.07</td>
<td>0.923</td>
<td>3.90</td>
</tr>
<tr>
<td>Post survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.788</td>
</tr>
<tr>
<td>Empathy</td>
<td>3.96</td>
<td>0.651</td>
<td>4.34</td>
<td>0.614</td>
<td>3.95</td>
</tr>
<tr>
<td>Pre-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.857</td>
</tr>
<tr>
<td>Empathy</td>
<td>4.13</td>
<td>0.628</td>
<td>4.41</td>
<td>0.572</td>
<td>3.97</td>
</tr>
<tr>
<td>Mid-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.707</td>
</tr>
<tr>
<td>Social Relaxation</td>
<td>4.00</td>
<td>0.851</td>
<td>3.93</td>
<td>0.799</td>
<td>4.13</td>
</tr>
<tr>
<td>Pre-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.767</td>
</tr>
<tr>
<td>Social Relaxation</td>
<td>4.00</td>
<td>0.926</td>
<td>4.00</td>
<td>0.807</td>
<td></td>
</tr>
<tr>
<td>Mid-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Relaxation</td>
<td>3.96</td>
<td>0.898</td>
<td>3.93</td>
<td>0.923</td>
<td>4.08</td>
</tr>
<tr>
<td>Post survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.623</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>3.60</td>
<td>0.893</td>
<td>3.14</td>
<td>1.026</td>
<td>3.33</td>
</tr>
<tr>
<td>Pre-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.982</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>3.17</td>
<td>0.848</td>
<td>2.21</td>
<td>0.902</td>
<td>2.26</td>
</tr>
<tr>
<td>Mid-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.715</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>3.56</td>
<td>0.848</td>
<td>3.31</td>
<td>0.891</td>
<td>3.64</td>
</tr>
<tr>
<td>Post survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.932</td>
</tr>
<tr>
<td>Altercentrism</td>
<td>2.40</td>
<td>0.736</td>
<td>2.21</td>
<td>0.902</td>
<td>2.26</td>
</tr>
<tr>
<td>Pre-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.715</td>
</tr>
<tr>
<td>Altercentrism</td>
<td>2.28</td>
<td>0.751</td>
<td>2.07</td>
<td>0.923</td>
<td>2.62</td>
</tr>
<tr>
<td>Mid-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.549</td>
</tr>
<tr>
<td>Altercentrism</td>
<td>2.44</td>
<td>0.769</td>
<td>2.07</td>
<td>0.923</td>
<td>2.62</td>
</tr>
<tr>
<td>Post survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.935</td>
</tr>
<tr>
<td>Interaction management</td>
<td>3.79</td>
<td>0.683</td>
<td>3.79</td>
<td>0.559</td>
<td>3.85</td>
</tr>
<tr>
<td>Pre-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.709</td>
</tr>
<tr>
<td>Interaction management</td>
<td>3.79</td>
<td>0.559</td>
<td>3.79</td>
<td>0.559</td>
<td>3.85</td>
</tr>
<tr>
<td>Mid-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.677</td>
</tr>
<tr>
<td>Interaction management</td>
<td>3.83</td>
<td>0.781</td>
<td>3.86</td>
<td>0.581</td>
<td>3.90</td>
</tr>
<tr>
<td>Post survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.788</td>
</tr>
<tr>
<td>Supportive</td>
<td>3.71</td>
<td>0.683</td>
<td>3.41</td>
<td>0.907</td>
<td>3.36</td>
</tr>
<tr>
<td>Pre-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.668</td>
</tr>
<tr>
<td>Supportive</td>
<td>3.48</td>
<td>0.785</td>
<td>3.48</td>
<td>0.785</td>
<td>3.33</td>
</tr>
<tr>
<td>Mid-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.577</td>
</tr>
<tr>
<td>Supportive</td>
<td>3.69</td>
<td>0.689</td>
<td>3.69</td>
<td>0.660</td>
<td>3.69</td>
</tr>
<tr>
<td>Post survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.686</td>
</tr>
<tr>
<td>Immediacy</td>
<td>4.50</td>
<td>0.648</td>
<td>4.72</td>
<td>0.455</td>
<td>4.31</td>
</tr>
<tr>
<td>Pre-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.766</td>
</tr>
<tr>
<td>Immediacy</td>
<td>4.59</td>
<td>0.568</td>
<td>4.59</td>
<td>0.568</td>
<td>4.36</td>
</tr>
<tr>
<td>Mid-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.628</td>
</tr>
<tr>
<td>Immediacy</td>
<td>4.44</td>
<td>0.712</td>
<td>4.79</td>
<td>0.491</td>
<td>4.36</td>
</tr>
<tr>
<td>Post survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.778</td>
</tr>
<tr>
<td>Environmental control</td>
<td>3.73</td>
<td>0.917</td>
<td>3.97</td>
<td>0.731</td>
<td>4.05</td>
</tr>
<tr>
<td>Pre-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.793</td>
</tr>
<tr>
<td>Environmental control</td>
<td>4.14</td>
<td>0.639</td>
<td>4.14</td>
<td>0.639</td>
<td>4.10</td>
</tr>
<tr>
<td>Mid-survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.598</td>
</tr>
<tr>
<td>Environmental control</td>
<td>3.96</td>
<td>0.824</td>
<td>4.03</td>
<td>0.778</td>
<td>4.13</td>
</tr>
<tr>
<td>Post survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.656</td>
</tr>
</tbody>
</table>

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

![Satisfaction with Mursion® Experience](image)

<table>
<thead>
<tr>
<th>Satisfaction Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slightly dissatisfied</td>
<td>17%</td>
</tr>
<tr>
<td>Moderately satisfied</td>
<td>43%</td>
</tr>
<tr>
<td>Neither satisfied nor dissatisfied</td>
<td>30%</td>
</tr>
</tbody>
</table>

![Use Mursion® on Own Time](image)

<table>
<thead>
<tr>
<th>Use Mursion® on Own Time</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>32%</td>
</tr>
<tr>
<td>Yes</td>
<td>68%</td>
</tr>
</tbody>
</table>

![Likelihood of Recommending Mursion® (Scale 1-10)](image)

<table>
<thead>
<tr>
<th>Likelihood Score</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1-1.0</td>
<td>1</td>
</tr>
<tr>
<td>1.1-2.0</td>
<td>0</td>
</tr>
<tr>
<td>2.1-3.0</td>
<td>2</td>
</tr>
<tr>
<td>3.1-4.0</td>
<td>0</td>
</tr>
<tr>
<td>4.1-5.0</td>
<td>0</td>
</tr>
<tr>
<td>5.1-6.0</td>
<td>2</td>
</tr>
<tr>
<td>6.1-7.0</td>
<td>3</td>
</tr>
<tr>
<td>7.1-8.0</td>
<td>2</td>
</tr>
<tr>
<td>8.1-9.0</td>
<td>6</td>
</tr>
<tr>
<td>9.1-10.0</td>
<td>12</td>
</tr>
</tbody>
</table>

*Figure 1. Group B results from Final Feedback Survey regarding satisfaction.*

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 A), 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 happy to say as a student at 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.”

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 Table 3, Figures 1 and 2, and Appendix A and B are discussed as it pertains to each research question in the following sections of this chapter.

Research Question One

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 3, the majority from both groups, 24 out of 50 chose ten 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 B). 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.

Discussion

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 Appendix A and B).

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.

Research Question Two

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

This study intended 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. 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 Mursion 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 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
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.

**Discussion**

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. The CSRS was designed to be used during live interactions, and since 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**

*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 A, 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.
Discussion

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 Appendix A and B).

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, but 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 and Kolb’s Experiential Learning Cycle with Mursion® 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 entirely 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 make 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 ECU, 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 means 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.
References


doi:10.1037/a0029219


doi:10.1007/s10972-014-9418-8


http://search.proquest.com.jproxy.lib.ecu.edu/docview/1323508516?accountid=10639


Saffron, J. (2015, March 11). *Officials Seek To Improve Teacher Prep In Ed Schools.* Retrieved from Carolina Journal: Officials Seek To Improve Teacher Prep In Ed Schools


Sperling, J. D., Clark, S., & Kang, Y. (2013). Teaching medical students a clinical approach to altered mental status: simulation enhances traditional curriculum. Medical Education Online, 18(1). doi:10.3402/meo.v18i0.19775

https://www.natcom.org/sites/default/files/pages/Assessment_Resources_Conversation_Skills_Rating_Scale_2ndEd.pdf


doi:10.1016/0883-0355(87)90012-7


<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Race</th>
<th>Major</th>
<th>Academic Year</th>
<th>Birth Year</th>
<th>What did you like most about using Mursion® to practice?</th>
<th>What did you like least about using Mursion® to practice?</th>
<th>What would you tell peers about Mursion® who haven’t experienced it?</th>
<th>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?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>White</td>
<td>Biochemistry</td>
<td>Senior</td>
<td>Senior</td>
<td>1997</td>
<td>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.</td>
<td>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.</td>
<td>It is a very good opportunity to practice daily communication skills that are crucial for success in everything you do.</td>
<td>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.</td>
</tr>
<tr>
<td>Male</td>
<td>White</td>
<td>Finance</td>
<td>Senior</td>
<td>Senior</td>
<td>1997</td>
<td>The difficult situations you are put in.</td>
<td>Sometimes not very relevant</td>
<td>Try it out.</td>
<td>Always can improve in these situations. More comfortable the better.</td>
</tr>
<tr>
<td>Female</td>
<td>Black or African American</td>
<td>Public Health</td>
<td>Junior</td>
<td>Junior</td>
<td>1998</td>
<td>What I liked most is that I felt like I was talking to a real human being</td>
<td>The only thing I didn't like was the surveys after every session but I know that's how the data was collected</td>
<td>This can change your attitude about the way you view your coaches</td>
<td>The technology and comfortable environment makes me want to come back on my own</td>
</tr>
<tr>
<td>Female</td>
<td>Other</td>
<td>Public Health</td>
<td>Freshman</td>
<td>Freshman</td>
<td>1996</td>
<td>The situations and having to be ready on the spot.</td>
<td>The avatar was weird at first but after I heard her reaction I was very comfortable.</td>
<td>Yes I think it's an experience that everyone should</td>
<td>To get better at talking to people</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td><strong>Black or African American</strong></td>
<td><strong>Communication</strong></td>
<td><strong>Freshman 1998</strong></td>
<td>Having someone to talk to and not being judged about it.</td>
<td>Just talking to an avatar, it was kind of weird at first.</td>
<td>They should do it because it is god practice for communication.</td>
<td>It's just good practice for communication.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td><strong>Black or African American</strong></td>
<td><strong>Psychology</strong></td>
<td><strong>Senior 1996</strong></td>
<td>I thought it was extremely interesting. The topics were applicable to our lives as athletes, and the avatar responses were extremely sport and lives.</td>
<td>I was just a little bit uncomfortable talking with the avatar on the screen, I feel like I could have better communicated with an</td>
<td>Mursion was an interesting experience, and I would recommend participating if given the option.</td>
<td>You won't experience anything like it. It'll blow your mind!</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td><strong>Black or African American</strong></td>
<td><strong>Undecided</strong></td>
<td><strong>Freshman 2000</strong></td>
<td>I think it was really cool even though it felt weird</td>
<td>I felt weird to have a conversation with a computer</td>
<td>That they should try it, it is an experience</td>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td><strong>White</strong></td>
<td><strong>Exercise Physiology</strong></td>
<td><strong>Sophomore 1999</strong></td>
<td>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</td>
<td>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</td>
<td>Yes, and I did</td>
<td>It would be amazing interview practice!! Would be really cool to get to sit down and practice your elevator</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td><strong>White</strong></td>
<td><strong>Operations and Supply Chain Management</strong></td>
<td><strong>Senior 1996</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
they could have disclosed how the 'robot' was communicating with us.

<table>
<thead>
<tr>
<th>Male</th>
<th>Other</th>
<th>Geography</th>
<th>Freshman</th>
<th>2000</th>
<th>The virtual avatar</th>
<th>Waiting on people in front of me</th>
<th>It's a fun experience</th>
<th>The virtual avatar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Black or African American</td>
<td>Political Science</td>
<td>Freshman</td>
<td>1999</td>
<td>I like that it gave me an opportunity to talk and know how to handle situations.</td>
<td>I did not like talking to a computer. It would have been better if I was talking to a actual person.</td>
<td>I would tell people that if given the opportunity they should definitely do it.</td>
<td>It was just a great practice tool.</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Finance</td>
<td>Junior</td>
<td>1997</td>
<td>The ability to practice a conversation, and if it did not go as I wanted I would just learn from it.</td>
<td>What I liked the least was that one of the scenarios was unrealistic to me so I felt weird doing a simulation on it.</td>
<td>I would tell peers if they were discussing how they would want to practice a hard conversation.</td>
<td>If I feel uncomfortable talking about a situation I would be able to practice it.</td>
</tr>
<tr>
<td>Male</td>
<td>Black or African American</td>
<td>Undecided</td>
<td>Other</td>
<td>1998</td>
<td>Seeing the avatar was cool</td>
<td>I felt like someone I didn't know was listening to my conversation in order to answer.</td>
<td>To try it out</td>
<td>explaining to me who I was talking too</td>
</tr>
<tr>
<td>Male</td>
<td>White</td>
<td>Business/MIS</td>
<td>Senior</td>
<td>1996</td>
<td>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.</td>
<td>The big amount of the same survey questions between the sessions.</td>
<td>Its pretty good and more realistic than you would have thought in the first place.</td>
<td>The job interview session</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Public Health</td>
<td>Freshman</td>
<td>1999</td>
<td>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</td>
<td>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</td>
<td>I told people about it but wasn't like 'oh my gosh you should so go do this'</td>
<td>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</td>
</tr>
<tr>
<td>Gender</td>
<td>Race</td>
<td>Major/Department</td>
<td>Year</td>
<td>Comment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------------</td>
<td>-----------------------------------------</td>
<td>------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>White</td>
<td>Business</td>
<td>Freshman 1999</td>
<td>Being able to hear a response off what would happen by a coach or teacher.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>White</td>
<td>Urban Planning</td>
<td>Freshman 1999</td>
<td>The realistic aspect of the surveys afterwards.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>Black or African American</td>
<td>Sports studies</td>
<td>Freshman 1999</td>
<td>The Mursion responding to what I said.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Communications</td>
<td>Freshman 1999</td>
<td>The reality of it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>White</td>
<td>Sports studies</td>
<td>Senior 1999</td>
<td>I really liked how life-like it was. It was the same exact feeling that I have felt in previous meetings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Business</td>
<td>Freshman 2000</td>
<td>I liked that I could practice talking to my coach.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Accounting</td>
<td>Senior 1997</td>
<td>That it gave a real life experience.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- It was a little weird to talk to a cartoon.
- They should do it because it's 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 I'd love to help out.
- I thought it was super realistic.
- It's a really cool research.
- It was weird not talking to a human.
- It's something to try.
- I'm not sure I just don't like it.
- Yes, I already have told others about it.
- It is very similar to real life.
- It's fun but weird that the avatar knows what you're saying.
- It's good practice.
- 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.
<table>
<thead>
<tr>
<th>Gender</th>
<th>Race</th>
<th>Major</th>
<th>Year</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>White</td>
<td>Construction Management</td>
<td>Freshman 1999</td>
<td>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).</td>
</tr>
<tr>
<td>Male</td>
<td>White</td>
<td>Business</td>
<td>Freshman 1999</td>
<td>I really enjoyed learning how to act in social situations. I enjoyed experiencing this technology. Having a conversation with the robot gave me good answers but it was too long. The use of technology is very applicable to the real life situations that I will face as a business major.</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Undecided</td>
<td>Freshman 1999</td>
<td>It helped me realize how to act with any type of administrator. The situations were all different and provided me with easy or hard conversations. 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.</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Biology</td>
<td>Sophomore 1999</td>
<td>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 and athletes. Even though not all 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.</td>
</tr>
<tr>
<td>Male</td>
<td>Black or African American Business Freshman 2001</td>
<td>The technology</td>
<td>Everything</td>
<td>It's amazing</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------------</td>
<td>----------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Female</td>
<td>Asian Engineering Junior 1997</td>
<td>Get to practice to speak with an administrator</td>
<td>It's uncomfortable</td>
<td>Nothing</td>
</tr>
<tr>
<td>Female</td>
<td>White Marketing Freshman 1999</td>
<td>It's useful to help learn how to communicate with an adult and helps you better understand how future conversations may go.</td>
<td>I did not like that the person I talked to kept making so many head motions and he didn't blink much.</td>
<td>I would tell them to try it because it's very beneficial to learning how to communicate.</td>
</tr>
<tr>
<td>Male</td>
<td>Black or African American Psychology Freshman 1999</td>
<td>They teacher responded as a regular person would</td>
<td>N/A</td>
<td>It's seems so real</td>
</tr>
<tr>
<td>Female</td>
<td>White Speech and hearing science Freshman 2000</td>
<td>I believe it is a great practice for social skills in conversation</td>
<td>It made me nervous</td>
<td>It's very neat</td>
</tr>
<tr>
<td>Female</td>
<td>White Public Health Sophomore 1999</td>
<td>Being able to try new technology</td>
<td>Nothing</td>
<td>It's amazing and it opens up your mind about things</td>
</tr>
</tbody>
</table>

*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.*
<table>
<thead>
<tr>
<th>Participant</th>
<th>What did you like most about using Mursion® to practice?</th>
<th>What did you like least about using Mursion® to practice?</th>
<th>What would you tell peers about Mursion® who haven’t experienced it?</th>
<th>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?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female White Audiology AuD 1993</td>
<td>I liked the following aspects of Mursion: -Realistic” -Real time -Avatar would acknowledge your weaknesses -You can end the session (if totally necessary)</td>
<td>I did not like that my peers surrounded me during the counseling exercises. I think that really hindered my ability to relax initially.</td>
<td>It's not as &quot;scary&quot; as it seems. It's truly like talking to an individual in a real clinic setting.</td>
<td>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.</td>
</tr>
<tr>
<td>Female White Audiology AuD Not Disclosed</td>
<td>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.</td>
<td>The avatar on this last session seemed harder to hear and also the signal was not the best.</td>
<td>Just relax and talk to the avatar like you would any other patient.</td>
<td>More convenient location. Main campus is not easy to get too when you do not have the parking pass.</td>
</tr>
<tr>
<td>Female White Audiology AuD 1994</td>
<td>It was nice to watch others counsel and learn what to do and what not to do.</td>
<td>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 &quot;pretend&quot; when the avatar has limited insight into how a real patient would ask. It’s also repetitive to watch the same</td>
<td>It was a unique experience. If given the chance to do it again, I would decline.</td>
<td>It just doesn’t compare to seeing real patients which I do every week. Might be better for a younger student.</td>
</tr>
</tbody>
</table>
Female
Not Disclosed
Audiology
AuD
Not Disclosed

- simulation and same answers over and over, after 2 people go I already know what to expect and it’s just redundant.
- 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
<table>
<thead>
<tr>
<th>Gender</th>
<th>Race/Ethnicity</th>
<th>Major</th>
<th>Year</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>Black or African American</td>
<td>Social Work</td>
<td>MS 1995</td>
<td>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.</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Social Work</td>
<td>MS 1980</td>
<td>The interaction with avatar seems as volume was in and out.</td>
</tr>
<tr>
<td>Female</td>
<td>Black or African American</td>
<td>Social Work</td>
<td>MA 1976</td>
<td>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.</td>
</tr>
<tr>
<td>Female</td>
<td>Black or African American</td>
<td>Social Work</td>
<td>MS 1996</td>
<td>Being able to see my peers and their interviewing styles and approach.</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Social Work</td>
<td>MS 1996</td>
<td>It still felt realistic as if a client was really there.</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Social Work</td>
<td>MS 1997</td>
<td>Client interaction</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Social Work</td>
<td>MS 1997</td>
<td>Enjoyed it</td>
</tr>
</tbody>
</table>

**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.**

**The interaction with avatar seems as volume was in and out.**

**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.**

**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.**

**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.**

**The experience and practice.**
<table>
<thead>
<tr>
<th>Gender</th>
<th>Ethnicity</th>
<th>Major</th>
<th>Degree</th>
<th>Year</th>
<th>Experience</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Black or African American</td>
<td>Social Work</td>
<td>MS</td>
<td>1985</td>
<td>The scenarios were realistic and the avatars responded as a real client would.</td>
<td>It was a fun experience but I also learned a lot.</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Social Work</td>
<td>MS</td>
<td>1976</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Social Work</td>
<td>MA</td>
<td>1991</td>
<td>getting that one on one client interaction</td>
<td>I was able to practice my skills without having an actual client.</td>
</tr>
<tr>
<td>Female</td>
<td>Black or African American</td>
<td>Social Work</td>
<td>MS</td>
<td>1967</td>
<td>engaging in conversation with client and asking for feedback from peers</td>
<td>I would encourage them to participate and explain to them the benefits of using Mursion to help with different techniques of counseling.</td>
</tr>
<tr>
<td>Female</td>
<td>White</td>
<td>Social Work</td>
<td>MS</td>
<td>1995</td>
<td>the experience of one on one sessions</td>
<td>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.</td>
</tr>
</tbody>
</table>

Female | Not Disclosed | Not Disclosed | MA | Not Disclosed | Being able to interact with a new client. | Nothing | I currently have a full-time job and Greenville is over an hour away from my home and job. |
<table>
<thead>
<tr>
<th>Female</th>
<th>I liked being able to practice clinical skills, with a real-like client.</th>
<th>I liked everything. I do wish it was a bit louder and more clearer audio.</th>
<th>It was a cool way to practice and you should try it!</th>
<th>The ability to practice!! It was amazing!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>It is like a real life experience.</td>
<td>It is one of the most real-life practice experience that you can gain.</td>
<td>It is an opportunity for growth.</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>This helps me to feel like I am legit talking to a real client.</td>
<td>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.</td>
<td>Good luck! It's hard but it's fun!</td>
<td>Nothing, I enjoy it but I would not come back unless I had to.</td>
</tr>
</tbody>
</table>

*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 experiences.