

# Debriefing Mixed Reality Simulations in an Educational Leadership Preparation Program: An Exploratory Case Study

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*Debriefing may be the most important factor for learning in simulations. This exploratory case study investigated a modified Plus-Delta approach to debriefings following mixed reality simulation-based learning. The findings suggested that educational leadership students who encountered debriefings from simulations developed leadership skills and dispositions and perceived that those acquired skills and dispositions would transfer to leadership positions currently or in the future. Implications and recommendations are provided.*

*Keywords:* mixed reality simulations, leadership preparation

Aspiring educational leaders need to be able to analyze complex situations, make effective decisions, and transfer and apply theoretical knowledge to practice (Gilbert, 2017). Learning to transfer theoretical knowledge into professional contexts as an educational leader is a central outcome of simulation-based learning that is grounded in situated and experiential learning for realistic and authentic learning (Boet et al., 2014; Cobb & Bowers, 1999; Lave & Wegner, 1991). However, to develop leadership abilities that can transfer to real-world settings, aspiring educational leaders need opportunities to practice these skills.

Mixed reality simulations, which combine both real and virtual worlds, may hold promise for teaching students how to develop leadership skills, including how to conduct conferences with a hostile parent or with a teacher who requires instructional coaching (Piro & O’Callaghan, 2020, 2021). In fact, simulations and the subsequent debriefings may help students to overcome their stress and anxiety as they develop new leadership practices, enhancing the learning process (Tremblay, et al, 2016), and having the potential to transfer that knowledge.

While mixed reality simulation usage and research is developing within educational leadership programs (for example, see Piro & O’Callaghan, 2020, 2021; Buckridge, 2016; Ceballos et al, 2020; Gilbert, 2017a), the debriefing element of the simulation experience has been under-researched. This current study is relevant because it aims to provide an exploratory look into the debriefing process of simulation-based learning in educational leadership preparation. The purpose of this study was to gain insight into the simulation debriefing process by exploring how participants in an educational leadership graduate program perceived the value of clinical supervisor debriefings for learning skills and dispositions following mixed reality simulations in an educational leadership preparation program.

### **Mixed Reality Simulation-Based Learning**

Simulations in the educational field provide opportunities for situated learning (Falconer, 2013; Utley, 2006) and learning through experience (Fanning & Gaba, 2007; Kolb, 1984). The purpose of simulations is to challenge the student to engage, make decisions and communicate as an actual professional (Dotger, 2015). A simulation can include any experience whereby a participant is immersed in a life-like environment (Dieker, Kennedy et al., 2014). Simulation-based learning seeks to “replace or amplify real experience with guided experiences” (Gaba, 2004, p. 12).

Teaching simulations originated in case studies that were read and then role-played in educator preparation programs (Dieker, et al., 2014). Recently, as technology has evolved, several virtual platforms for simulations have emerged in educator preparation, including SimSchools and Mursion, previously called TeachLivE (Dieker, et al, 2014). Both are mixed reality learning environments where real students interact with varying virtual avatars, whose roles depend on the goals of the simulation. Mixed reality simulations encompass both virtual and real environments, spanning the reality-virtuality continuum (Milgram & Colquhoun, 2014; Milgram & Kishino, 1994; Milgram et al., 1994). Therefore, mixed reality simulations are a combination of both virtual and real environments, imitating real-life scenarios (Milgram & Kishino, 1994; Milgram et al., 1994). This blending of the virtual and physical is encompassed by the term *mixed reality simulation*. Real students interact with virtual avatars and can train and re-train skills and

dispositions until they reach mastery (Bradley & Kendall, 2014; Dieker, Kennedy, et al., 2014; Dieker, Rodriguez, et al., 2014; Ludlow, 2015).

These mixed reality simulations are conducted through online scenarios via Zoom with specific targeted outcomes. They feature avatars known as virtual puppets, which are navigated by a human simulation specialist to engage a student interacting with the virtual environment from a computer (Bradley & Kendall, 2014; Dieker, Kennedy, et al., 2014). Avatars in virtual simulations are ‘...perceptible digital [representations] whose behaviors reflect those executed, typically in real time, by a specific human being’ (Nagendran, Pillat, Kavanaugh, Welch, & Hughes, 2014, p. 110). In educational leadership scenarios, avatars can represent various stakeholders, including parents or teachers. A simulation specialist controls the digital puppetry system in conjunction with basic artificial intelligence (Chini et al., 2016; Dede, 2009; Dieker, Straub, et al., 2014; Nagendran et al., 2013; 2014). The simulation specialist speaks through the avatar directly with educational leadership students offering real time conversational exchanges (Nagendran et al., 2013, 2014). The more life-like the simulation environment is, “the greater the participant’s suspension of disbelief that she or he is ‘inside’ a digitally enhanced setting” (Dede, 2009, p. 66). Mixed reality simulations provide a platform for educator preparation programs to engage with situated and experiential learning to achieve professional outcomes and skills (Piro & O’Callaghan, 2020; Bautista & Boon, 2015; Storey & Cox, 2015) and to develop a new identity as a school leader (Piro & O’Callaghan, 2020, 2021; Gilbert, 2017b).

Simulation-learning typically consists of three steps: 1) briefing, where the scenario and expectations are described to students; 2) simulation, where the scenario is performed; and 3) debriefing, where the simulation performance is addressed, often through pre-existing standards or guidelines (Cant & Cooper, 2011; Kriz, 2010). A community of practice (Lave & Wegner, 1991) may develop when simulations are performed with peers and a supervisor, who can observe the performance and then provide feedback through debriefings, helping students to identify and reach core professional skills.

### **Debriefings and the Reflective Process**

Hattie and Timperley (2007) defined feedback as “information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one’s performance or understanding” (p. 81). In a meta-analysis of feedback studies (Hattie, 2012) found that, “feedback has one of the highest effects on student learning,” (p. 18), suggesting that “feedback can be powerful” (Hattie & Timperley, 2007). Within the situated learning experience of the mixed reality simulation experience and the group learning environment of the peers and supervisors watching the simulation/debriefing experience, educational leadership students can co-construct their learning through an insightful feedback process called debriefing (Dede, 2009; Falconer, 2013).

Debriefings are an effective component of the simulation-based learning experience (Fanning & Gaba, 2007). Following simulations, debriefing engages and enhances students’ self-assessment for effective learning (Kolbe et al, 2015). Within the debriefings, the student who performed the simulation, supervisors and other learners can explore the simulation experience and offer feedback of the observation and reflection by both debriefer and student (Gardner, 2013; Sawyer, et al., 2016). Debriefers facilitate the dialogue following the simulation and

position themselves as co-learners within the process (Fanning & Gaba, 2007; Sawyer, et al., 2016).

Learner self-assessment is often an explicit goal of debriefings, leading to learning beyond the performance of the simulation itself, as the learner continues reflecting about the simulation (Arnold et al., 1985). Learner assessment promotes reflection upon strategies, goals, processes, and outcomes to adapt behaviors for effective learning following debriefings (Schmutz & Eppich, 2017). Reflective practices as part of debriefing processes enhance the simulation-based learning process (Harvey, et al, 2012; Nelson, et al., 2014). Critical self-reflection provides the aspiring school leader with a sense of personal responsibility for improving practice which is necessary for growth (Storey & Cox, 2015). Learner reflection can focus on the cognitive domain (Bloom, et al., 1956) and the skills developed through the debriefing, but also the affective domain (Krathwohl, et al, 1964). Cognitive processes can interplay with emotions and reactions in situational events like simulations (Rowe, 2013; 2014).

The emotional labor of using simulations with debriefing has been noted in the research (Author, 2021). Debriefing feedback can evoke negative emotions which affect student learning (Falchikov & Boud, 2007) and positive emotions, which can support motivation for learning (Rowe, et al, 2015). In fact, emotions may be central to all learning (Boud & Walker, 1998) and some have called for the interdependency of the cognitive and affective domains while theorizing reflection for learning (Thompson & Thompson, 2008). Empathy, the ability to elicit a corresponding emotional state in oneself, includes: (a) emotional contagion, the automatic mirroring of others' feelings, (b) proximal responsivity, the affective response when witnessing others' moods in close contact, and (c) peripheral responsivity, the affective response when witnessing others' moods in a detached context (Reniers et al., 2011). Emotional recognition, such as empathy with the avatar in the simulation and recognition of one's own emotional responses, is a germane learning outcome of simulations with debriefings (Author, et al., nd; Author, 2021).

The United States Army engaged in learner reflection following debriefings for engaging in feedback in a method called *After-Action Review*, which focuses on the ways one's performance met benchmarked standards and how one might improve in future circumstances (Sawyer & Deering, 2013). Like the *After-Action Review*, a debriefing style with a focus on learner self-assessment called a *Plus-Delta* debriefing framework promotes reflection on simulations and individual performance. The *Plus-Delta* approach describes a debriefing strategy in which "participants are asked to reflect on the entire simulation event (or portions thereof) and assess their individual and/or collective performance" (Cheng et al 2021, p.2.). *Plus-Delta* approaches to debriefings are conceptually and implementation easy (Cheng, 2021). Using a *Plus-Delta* approach, students in debriefings engage in self-assessment, leading to further learning beyond the simulation, itself (Cheng, et. al. 2021; Davis et al, 2006). Debriefers focus on asking questions, such as: What went well (the *plus* question)? What would you do differently (the *delta* question) (Eppich & Cheng, 2015; Mullan, et al., 2013; Zinns et al., 2017)? A third question can preface the plus-delta approach to debriefings: How do you feel? Addressing the emotional response first enables participants of the simulation to process anxiety following the simulation to subsequently address the plus and delta questions (Verkuyl et al, 2018).

### Connections to Current Research

Mixed reality simulations provide a safe environment for educational leadership students to confront stressors related to learning as they adopt leader identities for successfully conferencing in difficult conversations with parents or teachers without negatively impacting others (Piro & O’Callaghan, 2020, 2021; Dawson & Lignugaris/Kraft, 2017; Dieker et al., 2014). The ability to handle stress has been found to be an important skill arising from using simulations (Gul & Pecore, 2020). Additionally, the reflective processes of debriefing simulations have been found to be positive for learning (Harvey, et al, 2012; Nelson, et al., 2014). A modified *Plus-Delta* debriefing approach uses three steps: asking students to reflect upon how they feel following the simulation; asking them what went well in the simulation; and asking them how they might improve (Eppich & Cheng, 2015). This modified *Plus Delta* approach to debriefing (Eppich & Cheng, 2015) was studied in the current research to understand participants’ experiences.

## **Method**

### **Research Design**

This study investigated debriefings in simulation experiences using an exploratory case study design (Yin, 2014). Data were collected over one academic year. The case was bound by students participating in an educational leadership program in two semesters of an academic year taking two consecutive clinical courses that used mixed reality simulations with debriefing protocols in the curriculum. A debriefing experience open-ended survey collected responses about the learning and guidance in debriefings immediately following each debriefing. Concurrent with this data collection, in person and video observations, written reflections, and interviews explored the participant perceptions of learning from the debriefing in simulation experiences for educational leadership student-participants.

### **Research Question**

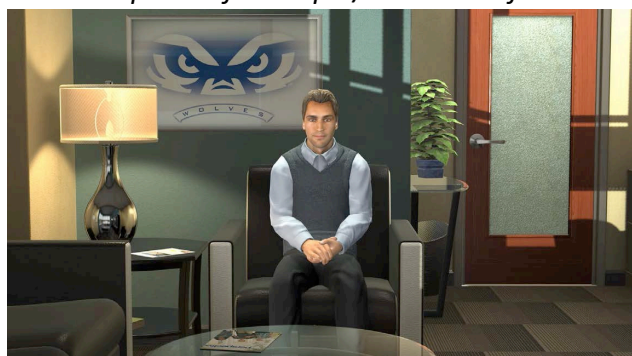
The following exploratory research question guided the study: How did participants perceive the value of debriefings for learning skills and dispositions following mixed reality simulations?

### **Setting**

The setting for the study was an educational leadership program at a state university in New England, United States. Student participants were enrolled in two subsequent educational leadership clinical courses in one academic year which were augmented with 15–20-minute mixed reality simulations which were delivered via Zoom from Mursion. The physical component was the computer screen with live human students depicted from cameras on their own computers and the virtual component was the computer screen depicting an avatar working with Mursion®, a California based company which creates virtual reality environments “where professionals practice and master the complex interpersonal skills necessary to be effective in high-stress professions” (Mursion®, nd).

Participants conferenced with an adult avatar for each conference, with the avatar being re-purposed depending on the scenario plot. In the first semester, participants conferences with a parent avatar and in the second semester, with a teacher avatar. Figure 1 depicts a view within the Zoom platform of an adult avatar as seen by the participant conducting the conference, as well as by their student peers, two clinical supervisors, and the researcher.

**Figure 1**  
*Screen Capture of Principal/Parent Conference Scenario*



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Two simulation scenarios were used, one for each semester, and participants delivered their performances twice each semester for a total of four simulations, approximately sixty to eighty total minutes of simulation/debriefing time per participant, eight hours of simulations/debriefings overall in the year of study. The first simulation, conducted twice in the first semester, focused on conducting a difficult parent conference with a parent who did not agree with district policy. The second simulation, conducted twice in the second semester, focused on delivering instructional feedback to a teacher struggling with student-oriented pedagogy. Table 1 illustrates the courses, frequency and timing of the debriefings following the simulations, and the scenario focus of the simulation.

**Table 1**  
*Courses, Simulations and Scenario Focus*

Total Courses	2 Subsequent Seminar-style Clinical Courses in Educational Leadership
Total Simulations and Debriefings	Total of 4
Total Time for Simulations/ Debriefings per Participant	60-80 minutes
Scenario Focus	Seminar 1- Conduct a principal/parent conference and deliver difficult news to a parent that a student must be suspended for infraction of a district policy.

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Seminar 2- Conduct a principal/teacher conference and create a plan of action to increase student talk in the teacher's class.

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### Sampling and Case

Educational leadership students pursuing an administrative certificate concurrently with an Ed.D. in Instructional Leadership comprised both the population and sample ( $n=5$ ). See table 2 for the case profile demographics.

**Table 2**

*Case*

Pseudonym	Self-Identified Gender	Self-Identified Race	Educational Level
Kiley	Female	White	Current EdD student in Instructional Leadership
Steve	Male	White	Current EdD student in Instructional Leadership
Gloria	Female	White	Current EdD student in Instructional Leadership
Joanne	Female	White	Current EdD student in Instructional Leadership
Tammy	Female	White	Current EdD student in Instructional Leadership

### Debriefing the Simulations

The two clinical supervisors, who also served as district superintendents, were assigned to participants for the seminar and related clinical experience were present and viewed each performance in the simulator in conjunction with the subsequent debriefings. Debriefings followed a Plus-Delta approach, with three questions being asked following a simulation: 1) How do you feel? This question was meant to illicit reactions and emotions associated with the debriefing to calm and release anxiety prior to the substance of the feedback; 2) What went well? This question was designed for the participant and debriefer to acknowledge actions that were positive for the expectations of the scenario; and 3) What would you do differently? This question was designed to guide the participant through a reflective analysis of how to improve

the simulation performance in subsequent simulations and to assist a transfer of knowledge to professional contexts. Participants participated in their own debriefings but additionally, listened to the debriefings of other members of the case following all simulations. Debriefings were provided from both clinical supervisors for each participant and lasted between 5-8 minutes, twice per semester, after each simulation for a total of twenty to thirty-two minutes per participant, or one hundred to one hundred and sixty minutes of debriefings for all participants during the year of study.

## **Data Sources**

There were six modes of data sources: a demographic survey, live and video capture of observations of the debriefings, debriefing experience open-ended survey, written reflections, a debriefing protocol, and exit interviews. The main forms of data were the reflections and interviews. The other forms of data were used for triangulation and trustworthiness purposes.

### ***Participant Demographic Survey***

A participant demographic questionnaire was administered just prior to the start of the first mixed reality simulation session in the fall semester of the study year. The survey asked respondents to indicate their preferred mode of communication, gender identification, occupation, subject and level of teaching experience, ethnicity, and use of past mixed reality simulations.

### ***Live Observations and Video Capture***

The mixed reality simulations and debriefings were recorded via Zoom, capturing both participants and student avatars as the participants interacted with the simulated avatars. The researcher watched the original simulations in live-time and re-watched the video data.

### ***The Debriefing Experience Survey***

Participants completed an open-ended survey informed by Reed's (2012) debriefing scale immediately following each simulation with questions related to reactions, what went well in the simulations, and how to change. Examples of questions related to analyzing thoughts and feelings about the debriefings included: 1) Reactions/Self-awareness: What did you feel? Other awareness: How do you think others felt? Metacognitive: What is your overall assessment of the performance? 2) What went well? Review the facts. Discuss understandings and skills. Generalize to real situations. 3) How do you want to change? Specific strategies. Takeaways. Goals.

### ***Participant Semi-structured Exit Interview Protocol***

A researcher-created semi-structured interview protocol was employed immediately after and final simulation session after the second semester of the research study. This instrument gathered data about the participants' perceptions of debriefings from the four



simulations they conducted during the year-long study. Participants were asked about their beliefs about the effectiveness of the debriefings.

### **Reflections**

The reflection instrument was given twice at the end of each semester of the study. It was modified from Petranek’s (1992) E’s of debriefing and included questions such as: Events: What went well, What would you change?; Emotions: Discuss your feeling during and after the simulation and after watching your video?; Empathy: How do you think the avatar felt?; Explanations: What is your analysis of the overall experience?; Everyday application: How do you see yourself responding to a situation such as in the workplace now that you have participated in the simulation?; and Employment of information: How do you see translating these skills and emotions into your everyday life?

### **Debriefing Protocol**

The debriefing protocol was completed by peers and facilitators following each simulation. Based upon a modified Plus Delta approach to debriefing (Eppich & Cheng, 2015), this written debriefing was provided to participants following the simulations. Items addressed included reactions (self-awareness, empathy and metacognition); what went well? (facts, understandings and skills); and application to real situations; and change (strategies, take-aways, goals). The alignment of research questions, data sources and constructs are demonstrated in Table 3.

**Table 3**  
*Alignment of Research Question, Data Sources, and Constructs*

Research Question	Question Type	Data Sources Used	Constructs
How did participants perceive the value of debriefings for learning skills and dispositions following mixed reality simulations?	Qualitative	Debriefing experience survey  Written Reflections  Debriefing Protocol  Interviews  Observations	Thoughts and feelings; learning; application; goals

### **Data Collection and Analysis**

The following table 4 demonstrates the participant and the data sources:

**Table 4***Participant Data Collection Sources*

<b>Pseudonym</b>	<b>Demographics</b>	<b>Interview</b>	<b>Video Observations</b>	<b>Post-Simulation Reflections</b>	<b>Debriefing Survey</b>	<b>Debriefing Protocol</b>
Kiley	X	X	X	X	X	X
Steve	X	X	X	X	X	X
Gloria	X	X	X	X	X	X
Joanne	X	X	X	X	X	X
Tammy	X	X	X	X	X	X

The demographic survey was delivered via Google Docs and took approximately 5 minutes to complete. The purpose of the demographic survey was to provide information about the case. Semi-structured interviews were collected via Zoom and lasted approximately 60 minutes each. Video observations of the debriefings were collected via Zoom and lasted approximately fifteen to twenty minutes. Each observation video was sent via an email link to participants. Written reflections were written at the end of semester within Blackboard, a learning platform used in the course, and were approximately 4 pages in length. The debriefing surveys were provided via a Google Form link and were approximately 3 paragraphs or 1-2 pages in length. The debriefing protocol was delivered via Google Docs in an email link and took approximately 5 minutes to complete.

Manual coding of the observations and reflections included deductive codes related to the literature on debriefings, such as self and other-awareness, reflection, debriefing difficulties and learnings, feedback awareness, value of debriefings (Miles, Huberman & Saldana, 2014) and inductive codes, such as adopting a growth mindset and lessons learned, with *in vivo* initial codes connected to both (Miles, et. al, 2014), finally being reduced to categories (Saldana, 2016). A codebook with each phase of reduction of the data (Crabtree & Miller, 1999) demonstrated the links from participant words to the emerging codes. Last, the data from the interviews and reflections were compared with the data from the observations and survey to triangulate the themes (Saldana, 2009). The final themes represented all data sources and were representative of all participants. Participant quotes are verbatim from the data, except that brackets are used for clarity of the narrative.

**Trustworthiness and Threats**

Credibility is when the reality that is presented resonates with the participants (Krefting, 1991). Credibility was established by a prolonged engagement with the case—a full academic year—as well as through triangulation of data (Creswell, 2013). Dependability was established through a systematic chain of evidence (Yin, 2009) used throughout data collection and data analysis, and confirmability was established by clearly detailing the methods of the study. A

researcher journal was established at the onset of the study and used through each data collection phase and bracketing addressed personal, methodological, and theoretical issues.

## Findings

There are two overall themes that emerged from this study: 1) new skills and dispositions developed; and 2) learned behaviors transferred to current professional contexts or were perceived to have the potential to transfer to future educational leadership contexts.

### Skills/Dispositions

Participants expressed that the debriefings following the simulations facilitated learning to conference as an educational leader, resulting in improved skills and dispositions. In her debriefing survey, Gloria stated that the debriefers' suggestions "helped me learn how to state the purpose of the meeting, guide the conversation, avoid interrupting or talking over the parent and always remain kind, calm, and firm." In her interview, Gloria expanded on the skills she developed by saying, "I learned to create goals from the feedback. I also learned from listening to other students' debriefings. I took notes and would reflect on my own simulation and apply other students' feedback to my own goals." Tammy agreed in her survey by reacting that, "their suggestions helped me learn how to state the purpose of the meeting, guide the conversation, avoid interrupting or talking over the parent and always remain kind, calm, and firm."

In his survey, Steve noted the importance of school policy as an outcome of his debriefings in the first semester. "The debriefers helped to strengthen my confidence in myself and feel comfortable in making a firm decision that is supported by school policy." In his interview, Steve noted that "I learned to set appropriate limits, have a boundary with the parent or teacher. And to feel confident with those limits. I can be too accepting, so learning to set parameters was helpful for me." Joanne acknowledged a similar perspective when she stated in her first reflection that she learned to "be prepared for the meeting with clear knowledge of district policy and also, a plan for moving forward with the student."

In her interview, Kiley emphasized how the first debriefing helped to prepare her for the second. "It was because I got that feedback, wrote down notes, thought of new things I wanted to try, [such as] how to drive the conversation, based on that debriefing and feedback." She continued, "they [the debriefings] reinforced what we were expected to do."

Having the feedback from the debriefings helped participants to develop dispositions that helped them to grow as learners. In her interview, Gloria stated, "I learned not to take the feedback personally and look at it objectively. Some people spent time defending their behaviors instead of hearing and internalizing it. I could see they were in a defense mode, and it made them spin." In her second reflection, Joanne noted that the debriefings assisted her to recognize the importance of being student oriented, as well. "Always focus and return to the student and their health, safety and well-being." She consistently wrote a t-chart after each debriefing that reflected the structure of the debriefings where she noted emotions, positives, negatives, and she reflected from those notes. (Interview).

Beyond these generalized skills, various dispositions developed through the debriefings. Specifically, participants recognized emotions and emotional regulation, and developed both a reflective stance and a growth mindset.

### ***Emotional Recognition and Emotional Regulation***

Kiley reacted to the debriefings when she was asked to share her emotional state prior to the start of feedback from her debriefers. “Having that step, before I got feedback was like a big exhale. Having that ability to exhale, talk about emotions was helpful” (Interview). Gloria reflected upon the anxiety she experienced following the first debriefing. “The first simulation [debriefing] made me feel extremely anxious. I tried hard to control my emotions, but in watching the video I sensed some of the same feelings again, and I could see my frustration.” Kiley stated, “At the time the experience was stressful and caused feelings of anxiety, but that is also what happens in real life when dealing with uncomfortable situations” (Reflection 1). In her first reflection, Joanne felt similarly. “ My heart was pounding, and I was surprised by how nervous I felt talking with a fake person and then debriefing in front of my teachers and classmates.” Upon reviewing his debriefing in his simulation video, Steve recognized his body was displaying tension with the parent-avatar in simulation one. “ I know there are things I could improve such as my body language and level of tension. I want to remain as relaxed as possible to foster an atmosphere of support, respect, and trust with all families.”

Gloria recognized the emergence of anxiety with the debriefings and how that anxiety improved in the second semester. “I was very nervous prior to the first simulation [debriefing]; and disappointed after my first simulation [debriefing]. I was anxious and eager prior to my second semester [debriefing] and confident following the wrap up of the second.” Kiley also perceived emotional management in later debriefings. “We also had the ability to see others handling the same situation, which allowed us to mentally and emotionally prepare for our own turn.” Though the debriefings were sometimes difficult to hear, Tammy related the benefits of receiving feedback for personal growth when she said, “I learned I have to exhibit control, and levelheadedness (Interview) . Kiley reflected upon her emotional regulation in the second semester of the simulations and debriefings. “In the second semester, because I had prepared for the same scenario, and had the experience of the first semester’s debriefings. I felt in control and handling the situation in the best interest of both parties.”

Empathy building was part of the recognition of emotions and emotional management from the debriefings. Joanne stated (Reflection 1), “I tried to imagine how I would feel as a parent. I think that I would feel like the punishment was overly harsh.” This empathy developed into emotional regulation. Joanne continued, “I have started to feel much more peaceful with myself, less judgmental and more empathy towards others and their struggles. I have started to feel less fear when facing situations where there is conflict and discord.” Steve also maintained that it was important to understand the avatar’s emotions to build connection and reduce pressure from the conversation (Reflection 1). In reflection 1, Kiley noted her own empathy building from watching the simulations with debriefings. “There were times when I was watching my peers because they might have been struggling with the scenario and I wondered, how they are going to get through the debriefings. I was concerned for them.”

### ***Self-Reflection Leading to a Growth Mindset***

All participants noted that self-reflection was a disposition they developed from debriefings. In her interview, Kiley noticed that “self-reflection was a disposition I gained, and with it came the ability to take the constructive feedback from another person and not take it personally.” Her second reflection mirrored this sentiment. “Being able to self-reflect, get feedback from our clinical supervisors was the best opportunity for growth in the second semester.” The debriefings led to constructive reflection for Tammy, who noted in her interview that “they [the debriefers] allowed me to reflect in a constructive way. They gave me a framework to think about what I could do better. For planning, to prepare for the following simulations. They gave me a perspective of what needs to be done.” Steve agreed. “I learned reflective skills. I am confident that I have the skills for future difficult conversations.” In her survey, Joanne noted that, “the debriefing is a nice check-in, to recalibrate and think about performance”.

A second disposition gained by all the participants from the debriefings was the development of a growth mindset following reflection. In her interview, Gloria explicitly stated her development of a growth mindset. “The whole process gave me a growth mindset. They [the debriefers] said you did this well, and there are some other areas you could improve. And then the meeting did go better in the next simulation.” Steve clearly demonstrated the development of a growth mindset when he stated in his first reflection that, “mistakes allow people to learn and grow, and constantly improve as a society. This is what I will be taking away with me from this simulation and debriefing experience.” In her second reflection, Kiley noted how debriefings provided elevated learning. “Getting feedback from our clinical supervisors...was the best opportunity for growth for the second simulation”. Her interview data suggested a similar sentiment when she said that she developed a “growth mindset—what do I need is progress—not perfection. To take that information and use it for the future makes us good leaders.” In the debriefing survey, Joanne summarized this disposition resulting from the debriefings. “This type of feedback for continuous growth is priceless.”

In her interview, Tammy noted the intensity of having two debriefers following her simulations and how they induced anxiety, but how she pushed through and learned from the debriefings. “Because there were two debriefers, it was a bit intimidating. But so helpful. The discomfort was because I was growing. Uncomfortable, but needed.” Having two debriefers following the simulations was, “very rich, like having both a brownie and a fudge brownie. It was a lot but still appreciated. It was still chocolate.”

### **Transference to Professional Contexts**

Participants noted the ways in which they translated their burgeoning leadership skills and dispositions following their experience with the simulations and debriefings into application into present circumstances or considered that application into future leadership contexts. This applied knowledge included conflict resolution, listening as a leader, and transferring the growth mindset to professional practice.

The first transfer of knowledge related to conflict resolution. In her second reflection, Gloria noted that she will, “regulate my emotions based on the environment and intended

outcome of what I desire from the meeting.” As an instructional coach in her current position, Gloria noted the difficulty of working with people who were in a defensive mode, and that they were rationalizing their behaviors instead of learning from the feedback. She recognized that she wanted to create contexts where teachers “integrate feedback, internalize it and activate the feedback.” She continued, “defensiveness means that people will not hear the feedback.” The importance of feedback to Gloria was paramount. The debriefings, “are a practice that should be increased. Also, having an audience for debriefing, putting yourself out there, really raised the bar for risk taking.” Performing in front of others and receiving a public debriefing was a benefit that would impact her own instructional coaching (Interview).

In her second reflection, Kiley reflected on the conflict within the simulations and what she took from the debriefings. “Most people prefer to avoid conflict, but in work and everyday life, that is not possible. Learning how to turn conflict into resolution is a true skill.” Kiley noted that asking for feedback from peers and supervisors, even if it was difficult, was a practice she hoped to continue following the debriefings and that this sort of mentoring was a mindset that she valued and would continue herself in future supervisory positions (Interview).

In his first reflection, Steve stated, “Now that I have experienced this type of situation and pressure, I feel more prepared to support families, school safety, and school policy.” He continued, “I want to feel more confident in the decision, because it protects the safety of all students. I need to lean more into the policy and why it is important as a whole.” In his interview, Steve recognized that having that conflict within difficult conversations (both in the simulation scenario and the following debriefings) is endemic to being a leader in education. Approaching difficult conversations from a leadership perspective, and being someone who makes instructional improvements, will help him to structure strategies to set up and support learning prior to engaging in those difficult conversations as an educational leader.

Joanne recognized the importance of the debriefings for framing future conflictual conferences with a parent or teacher. “I think learning how to have a tough skin; it’s not a person thing; it is the just the situation as a leader to have to receive and give difficult feedback”. (Interview). She reflected that while she was not yet in a leadership position at her school, the debriefings helped her to become a more active listener in her own parent meetings. Joanne’s discussed that she would transfer the disposition of listening within difficult conversations to leadership contexts. She learned that “letting them say their piece and repeating back” was important and that she would state, “Let me make sure I understand that this is what you said, this is our plan going forward.” In her second reflection, Joanne remembered adopting the four-part compassionate communication process from Rosenberg’s (2015) *Nonviolent Communication* to help her manage her communication in the debriefings. She stated that the debriefings, “were an incredible opportunity and reminder to communicate clearly and compassionately.” She continued that for her, the lesson learned that would transfer into future leadership practices was that “communication based on mutual respect will help each person contribute the best they have to offer to our collaborative endeavor and make our shared success possible.”

Tammy recognized that at times, she needed to hear difficult feedback about her performance in the simulations as part of developing a growth mindset. In her interview, Tammy reacted that the debriefings changed her perspective about how to coach teachers. Some teachers in her district had a difficult time learning and growing following coaching encounters

with her. Tammy related that one teacher wrote unprofessional goals that were submitted to her, but the teacher was still proud of them. Following receiving structured feedback in the simulation debriefings, Tammy decided to model goal-writing to help the teacher to rewrite them with her feedback. The feedback she had received from the debriefings helped her realize how crucial feedback was for personal and professional growth, and to transfer that practice of providing feedback into her own coaching of teachers.

## **Summary of Findings**

Participants expressed that the debriefings following the simulations facilitated learning to conference as an educational leader, resulting in improved skills and dispositions related to leadership. Some of those skills and dispositions included emotional recognition and management and adopting a growth mindset. Participants further reflected on transferring skills to the professional workplace, such as conflict resolution, listening in difficult conversations, and transferring a growth mindset when working with teachers by modeling skills.

## **Discussion and Implications**

The first theme was that participants emerged from the simulation debriefings with new skills and dispositions. A disposition that all the participants acknowledged was the ability to recognize and regulate their own emotions; and further, to develop empathy with the avatar's emotions. Emotional labor occurs from using simulations with debriefings (Piro & O'Callaghan, 2021) and further, emotional recognition and regulation are integral to cognitive and affective empathy (Bertrand et al., 2018; Eisenberg, 2000; Hall & Schwartz, 2019; Lockwood et al., 2014). Comprehending the feelings and experiences of others by imagining what that person was feeling and being able to elicit a corresponding emotional state in oneself (Reniers et al., 2011) was a disposition gained from the debriefing and reflecting process. An implication for practice is that one needs to modify one's own emotional state prior to a simulation and debriefing experience and that this process may need to be explicitly taught to students in simulations and debriefings (Brooksbank, 2022). In essence, students need recognition of deep acting, which is attempting to modify one's own emotional state to bring it into agreement with an emotional state that is beneficial for the present situation (Brooksbank, 2022; deCastro et al., 2004; Joseph & Newman, 2010). Further, emotional awareness abilities have been shown to be positively related to self-efficacy beliefs (Alrajhi et al., 2017; Valente, Lourenço et al., 2020; Valente, Veiga-Branco et al., 2020). For educational leaders, this implication suggests that emotional awareness and regulation may prepare them for confrontational conferences with parents or teachers, and that preparation for emotional responses is a step toward developing self-efficacy in conferencing as an educational leader. A recommendation is to consider social-emotional learning that targets emotional recognition and emotional regulation processes and specifically, to focus on empathy building in educator leadership programs using simulations with debriefings.

Related to the awareness of anxiety, stress and empathy from the debriefings is that participants suggested that a growth mindset was a disposition they adopted following

experiencing difficult emotions and awareness of the avatar's emotion. Students with a growth mindset do not blame outside factors for their failures, and they look for ways to improve on the next assessment (Dweck, 2006). Their beliefs in the importance of continued effort permits them to view failure as a motivator that promoted further learning (Blackwell, et al., 2007; Plaks & Stecher, 2007). Students with a growth mindset use constructive feedback to improve, and they are willing to learn from the successes and failures of others (Saunders, 2013), even when feedback is negative (Dweck, 2006).

An intervention addressing mindset may be advantageous for educational leadership students who are involved with debriefings. However, interventions should be aligned to the academic curriculum for the interventions to be effective (Saunders, 2013). As a result, growth-mindset instruction should relate to the explicit outcomes of the scenarios and expectations for the simulations and subsequent debriefings (Brooksbank, 2022). In the context of this study, this alignment suggests that growth mindset instruction should be oriented toward the skill of conferencing in difficult conversations as an educational leader to be effective for a growth mindset perspective. Future research might explore the relationship between growth mindset intervention types and simulation debriefing outcomes.

The second theme suggested that participants perceived the ability to transfer their acquired knowledge to professional contexts following simulation-based debriefings, or to consider the possibility of knowledge transfer when they became educational leaders. Transfer of learning is "the application of acquired competencies in new contexts" (Rivière, et al., 2019). Research has suggested that there may be metacognition benefits of knowledge transfer beyond simulations with debriefings (Ganier, Hoareau, & Tisseau, 2014; Miles, 2018). Additionally, there is a potential for both declarative and procedural knowledge to transfer to real-world contexts (Bossard et al, 2008) and further, that learning transfer from one context to another engages higher order cognitive processes (Bransford, 2009, p.6). The implication of the current research and related literature is that simulation-based debriefings may be effective for cognitive and emotional knowledge for transferring knowledge to educational leaders' professional contexts. More research is necessary to make this connection explicit.

The debriefing sessions following the simulations were, by their structure, social interactions "between individuals and materials in authentic contexts (Lave & Wegner, 1991, p. 2). Some researchers on simulation debriefing have suggested that learning occurs primarily through the debriefing, not the performance of the simulation (Cheng, et al, 2014; Shinnick et al, 2011). Therefore, debriefing facilitators should be trained to use a debriefing framework (Cheng et al, 2014) that connects the expected learning outcomes in the real-world to the feedback. An implication is that choosing the right debriefers is critical for the development of skills and the transfer of knowledge for educational leadership students, as is providing a debriefing structure, such as the Delta-Plus debriefing protocol used in this research. A recommendation is that debriefers should be experts in their fields and immersed in the real-life contexts that match the learning outcomes of the debriefings. This research used a modified Plus Delta approach to debriefings; however, other debriefing approaches might be investigated. Additionally, future research might compare simulations with no debriefings to those with debriefings to understand the impact of the debriefings on learning.



## **Limitations**

Because there was racial homogeneity in the sample, population validity (Gall, et al., 2003) may limit generalization of the study's findings. Participants in this study were all Ed.D. in Instructional Leadership students who were also obtaining a state certificate for educational leadership valid up to the Associate Superintendent level in districts. Therefore, their background in teaching and learning theory may have biased them to perceive learning concepts, such as growth mindset and the connection between emotions and learning, and this knowledge may have impacted their perceptions. The specificity of the participants' educational backgrounds and the small number of participants makes this study contextual, and the findings are local for this case. However, educational leadership programs considering simulation-based learning with debriefings may find value in the outcomes for developing their own debriefing platforms.

## **Conclusion**

Through a modified Plus-Delta approach to debriefing, this study found that educational leadership students gained the skills and dispositions of educational leaders related to conferencing with various stakeholders and perceived that their acquired knowledge transferred, or will transfer, to leadership contexts in schools. Educational leadership programs might consider social-emotional and growth mindset training for students engaged in simulation-based debriefing. Further, these programs should consider relying on experienced debriefers and structured debriefing protocols to enhance learning transfer from simulation debriefing settings to educational leadership contexts.

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