

Constructive Destabilization within the Liminal Space: Doing, Debriefing and Deliberating in Mixed Reality Simulations

Jody S. Piro

Western Connecticut State University

Catherine O’Callaghan

Western Connecticut State University

The purpose of this qualitative case study was to explore how educational leadership students journeyed through liminality within simulation experiences. The doing of the simulation, the subsequent debriefing, and the final deliberating of the experience defined the entire simulation experience within the context of this study. Data sources included simulation and debriefing observations, participant reflections, and interviews.

Participants within the simulation experience experienced constructive destabilization within liminality and negotiated this disequilibrium to develop new concepts, skills, and attitudes. The mixed reality simulations provoked vulnerability, difficult emotions along with regulation, and paradoxes that participants negotiated toward an emerging leader identity. Yet, navigating this turbulence was the necessary process toward a reconstituted leader-self. The process of journeying through this liminal state of constructive destabilization was necessary to facilitate growth and leadership development.

Liminality is an in-between phenomenon. It is a place of movement, change and emergent ways of being. As learners undergo the cognitive process of assimilation and accommodation, their prior knowledge and skills are reformulated into a different configuration or schemata (Myer & Land, 2005; Land & Ratteray, 2017). Liminality explores the states of *betwixt and between* through which one travels in any life event (Turner, 1987). Used by van Gennep (1908/1960) to associate ritual and rites of various passages in a society, the notion of liminality has also been attributed to individuals who “fall in the interstices of social structure; are on its margins” (Turner, 1969, p. 125). Liminality enables individuals to pass from one position to another (van Gennep, 1980), often within a community of individuals who are bound together through the passage (Turner, 1969).

The exploration of liminality in educational settings, specifically in the study of leadership, is a relatively new field (Guinemas Costa & Pina, 2013). Liminality integrates ways of thinking and doing within a specialized body of knowledge such as leadership (Yipp & Raelin, 2011). Liminality is also a process through which individuals can forge new identities while their cognition is transformed (Piro & O’Callaghan, 2019). This process of transformation is a turbulent one in that emerging school leaders must navigate their emotions while they shed identities as classroom teachers and construct new identities as principals or district supervisors (Rattray, 2016).

The state of liminality can be explored through simulations (Piro & O’Callaghan, 2019a, b). A simulation can be viewed as “a simplified, dynamic, and accurate model of reality that is a system used in a learning context” (Sauvé, Renaud, Kaufman, & Marquis, 2007, p. 253) and within the current study, a mixed reality simulation experience was used. According to Milgram and Kishino (1994), mixed reality environments lie in the middle of a continuum between actual reality and virtual reality. With this emerging technology, mixed reality simulations allow people to practice skills and rehearse strategies with avatars (Dieker, et al., 2013; Dieker, Straub, Hughes, Hynes, & Hardin, 2014).

Previously, we explored mixed reality simulations embedded in a community of practice and found that educational leadership candidates traversed three learning spaces: separation, liminal and emerging professional portals (Piro & O’Callaghan, 2019b). The purpose of this current research was to explore more deeply the liminal space of mixed-reality simulation experiences.

Literature

The literature is bound in liminality, constructive destabilization, and the three D’s of the simulation experience: the doing of the simulations; the debriefing after the simulations; and the deliberating that occurred following the simulations.

Liminality

The concept of liminality emerges from the field of anthropology (Turner, 1967; 1987; van Gennep, 1960). Coming from the Latin word *limen* (Meyer & Land, 2005), it suggests a threshold through which one crosses, as within rites of passage (van Gennep, 1960). Recently, the notion of liminality has been applied to professional learning in police education (Rantalalo & Lindberg, 2018) and teacher education (Piro & O’Callaghan, 2019a; Cook-Sather & Alter, 2017). Liminality is a process which shapes cognition (Soderburg and Borg, 2018) as the individual actively engages

in the formation of a new identity. Traveling through liminal spaces is a turbulent journey in that the emerging self will shed previous concepts and construct new identities (Guinemas Costa & Pina, 2013).

Threshold concepts are portals within liminality that enable learners to deeply understand concepts that lead to transformative ways of knowing (Land & Rattray, 2017). The threshold concepts become an integral part of the learners' identity, such that further learning without the threshold concepts is impossible (Tucker, Weedman, Bruce, & Edwards, 2014). Recent research suggests that individuals traverse several transition points to attain threshold concepts as they move from difficult emotions, doubt and troublesome knowledge to transformative understanding (Irving, Wright & Hibbert, 2019). Liminality cannot be divested of the emotions that are aroused when individuals confront previous concepts or identities that do not fit with the emerging new paradigm or professional lens (Irving, Wright & Hibbert, 2019). The key to unlocking this transformation is using emotions as mechanisms to access liminal spaces coupled with reflection on the process (Hay and Samra-Fredericks, 2016). Otherwise, individuals may be halted in their progression toward attainment of concepts if their anxiety results in panic or anger (Gilmore & Anderson, 2016).

Mixed-reality simulations provide a vehicle to scaffold the journey through these liminal spaces as students experience contextualized professional situations and they reflect on their response to them (Piro & O'Callaghan, 2019a, b). Yipp & Raelin (2011) posited that threshold concepts in leadership should focus on those "meta-competencies" that help leaders understand how to process their lived experiences toward new ways of thinking. Mixed-reality simulations allow emerging leaders to role-play these meta-competencies, such as learning to conference as an educational leader, while students dialogue with their peers and instructor on their actions within the contextual situation (Yipp & Raelin, 2011).

Liminal State of Constructive Destabilization

The utilization of mixed-reality simulations in leadership preparation may create emotional turmoil while the leadership candidate is challenged to apply new concepts and skills in novel situations (Fanning & Gaba, 2007). Research on leadership development that is rooted in adult cognitive development posits that leadership awareness, leadership self-efficacy, self-awareness, leader identity and leadership knowledge, skills, and competencies are key components of the developmental process (Day & Dragoni, 2015). To facilitate the developmental process, leadership candidates need experiential lessons that foster meaning-making and cognitive shifts (Reams, 2017). The constructive developmental theory applied to leadership focuses on making meaning from disorienting dilemmas that create cognitive disequilibrium (Keegan, 1994; Torbet, Fisher & Rooke, 2004). Reflective inquiry on this state of disequilibrium is pivotal to developing new concepts, skills, and attitudes (Reams, 2017). The process of journeying through this liminal state of constructive destabilization is necessary to facilitate growth and leadership development (Kegan, Lahey, Fleming and Miller, 2014). Within the current study, this journey was established through the 3 D's of doing, debriefing, and deliberating.

The 3D's of Doing, Debriefing, and Deliberating in Mixed Reality Simulations

Simulations have been used for training purposes in fields such as aviation, the military, and medical fields for decades. In the field of education, however, the application of simulations is

relatively new (Bradley & Kendall, 2014; Dieker, Rodriguez, Lignugaris/Kraft, Hynes, & Hughes, 2013; Kaufman & Ireland, 2016; Shaffer, Dawson, Meglan, Cotin, Ferrell, Norbash & Miller, 2001). In this study, we refer to the mixed reality simulation experience as having three components: the performance of the simulation (the Doing); the feedback following the simulation (the Debriefing); and the reflection after watching the performance video (the Deliberation). Each of these are addressed.

The performance of the simulation as the *doing* part of the simulation experience is in the initial component of the mixed reality simulation experience. Recently, simulations have gained momentum in educator and school leadership preparation. To maximize learning in simulation-based curricula experiences, “safe spaces” are required for participants to take risks in the simulation and to fail if necessary, to grow professionally (Hall & Tori, 2017). Mixed reality simulations within educator preparation provide an embodied learning process (Lindgren & Johnson-Glenberg, 2013) that may be enhanced by communities of practice, such as in a learning laboratory where emerging leaders may practice leadership skills while minimizing risks to humans (Dieker, Kennedy et al., 2014; Dieker, et al., 2013; Piro & O’Callaghan, 2019a). Leadership students may make mistakes and receive focused feedback to improve their skills (Dalgarno et al., 2016; O’Callaghan & Piro; 2016; Piro & O’Callaghan 2019b) and explore the liminal process of becoming a leader.

A key ingredient that is often overlooked in a simulation-based learning curriculum is the *debriefing* process. The debriefing process may be the most critical component to facilitate the connection of theory to practice and to clinically process the experience (Decker et al, 2013). Despite the critical importance of this component, a review of the literature indicated that only a limited amount of studies have focused on the debriefing process for simulations (Hall & Tori, 2017). Furthermore, the field has yet to identify evidence-based effective models of debriefing. Models of debriefing focus on three phases: 1) description of the event; 2) analysis/analogy of the event; and 3) application. Some reflection can happen naturally after an event but is often unsystematic and does not go beyond description (Fanning & Gaba, 2007).

A skilled facilitator or coach enables the leadership candidate to unpack these layers of underlying assumptions through the debriefing process. The first phase of the debriefing process is a description of the events that occurred by the participant; the second phase is identifying the emotions it aroused from the participant/group or emotional content of the discussion. The final phase is the analysis of the different views of each participant and how they contribute to the whole—the generalizability and application of the experience and evaluation of behaviors (Fanning & Gaba, 2007). A skilled facilitator gauges the participants’ needs and pivots the discussion towards the learning objectives of the simulation. Immediately after the simulation, when emotions are raw, the skilled facilitator defuses the emotions and guides the participants to detach their feelings from the event so that it can be analyzed rationally (Hall & Tori, 2017).

Dismukes and Smith (2000) posited three levels of debriefing performance. High level is where the participants debrief themselves and the facilitator plays the role of catalyst by asking open ended questions and then, artfully using silence. Participants create their own prescriptions for change. Intermediate level is when the facilitator must be more involved, though the participants can mostly discuss on their own performance. Techniques for this level are rewording or rephrasing, raising questions or asking a member to comment on another’s response. Low level is when the facilitator is most involved because participants are disinclined to respond and must explicitly model analysis or identify strategies. The key component to the debriefing process is the

skill of the facilitator or coach as they guide the participant through the event to foster reflective practice (Hall & Tori, 2017).

In the final component of the mixed reality simulation experience, participants engaged in reflection of the doing of the simulation and debriefing, known as the *deliberating* part of the simulation experience. Reflective inquiry enables the leadership candidate to access the internal operating system that contains their underlying beliefs and assumptions as well as personality traits (Reams, 2017). As noted by Reams (2017):

One of the highest leverage activities for developing leadership capacity is conceptualized as being able to enable leaders to take a perspective on their “internal operating systems.” These self- systems are made up of layers of structures of interpretation, meaning making and the ordering of experience that goes on inside of us. Learning how to “get on the balcony” or take a perspective on this operating system involves examining what has previously been unconscious, habitual, or assumed. These elements determine the range and depth of choices and behaviors available to leaders, which can be unpacked in layers as we evolve our perceptual capacities through developmental stages. (p. 339)

A skilled facilitator or coach guides the leadership candidate through the reflective inquiry process and assists the emergent leader in decoupling the emotional response from the situation or issue (Hall & Tori, 2017). It is through deliberating on the internal operating systems underlying their cognitive processing of the situation or issue at hand, that the leadership candidate gradually traverses liminal spaces towards attainment of the threshold concepts (Reams, 2017).

The doing of the simulation, the subsequent debriefing, and the final deliberating of the entire experience defined the entire simulation experience within the context of this study. The purpose of this study was to explore how educational leadership candidates journeyed through liminality within simulation experiences.

Method

This collective case study (Creswell, 2007) studied the phenomenon of liminality through mixed reality simulations with educational leadership student participants. The case was bound by graduate students registered in a cohort model of an educational leadership program and participation in mixed reality simulations. The research question that guided the study was:

What are educational leadership students’ perceptions of liminality as they developed conferencing skills within the mixed reality simulation experience, which included performing the simulation, debriefing on the simulation and deliberating about the simulation?

Setting

This study took place at a university located in the northeastern United States within a program that is accredited by the Council for the Accreditation of Educator Preparation (CAEP). The research studied graduate students in an EdD program in Instructional Leadership who added on a year-long educational leadership certification program. Two courses in the educational leadership certification program used mixed reality simulations within their curriculum as part of their year-long clinical experiences and coursework. These courses included one mixed reality simulation per course per semester focused on learning to conference as an educational leader as a focused threshold concept for the simulation related to learning to conference with a parent and with a

teacher. The foci of the scenarios were written by Mursion (Mursion®, 2020). The guiding rubric used for performance outcomes and for observational purposes for the study was written by the authors.

Mixed Reality Simulation Lab

The setting of the study was the mixed reality simulation laboratory of two consecutive graduate level educational leadership courses which used simulations to practice conferencing skills as an educational leader. The simulation laboratory used technology developed originally as TeachLive at the University of Central Florida and commercialized by Mursion®. Mursion® is an avatar-mediated training simulation system that operates with a “human-in-the loop approach” [that] combines digital puppetry (Nagendran, Pillat, Kavanaugh, Welch, & Hughes, 2013; Hunter and Mapes, 2013; Mapes, Tonner, & Hughes, 2011) with basic Artificial Intelligence processes. The scenarios used in the simulations provided the graduate-level educational leadership participants opportunities to practice various communication skills, such as delivering difficult news to a parent (semester one) and coaching a struggling teacher (semester two) within a conferencing scenario. The focus for the first scenario and second scenarios are described in Table 1.

Table 1

Focus of the Simulation Scenario

Simulation Scenario Focus

Seminar 1- Deliver difficult news.

Conduct a principal/parent conference and deliver the difficult news to parents that their student must be suspended for fighting.

Seminar 2- Assist a struggling teacher to use more student talk in the classroom.

Conduct a principal/teacher post-observation conference and create a plan of action to increase student talk in the teacher’s class.

The mixed reality lab consisted of a real classroom with a semi-circle arrangement of desks for students around a computer and large TV screen which had a connection to Mursion® and their simulation specialists, people trained in the outcomes of the specific scenarios who are represented as avatars on screen, the virtual component of the simulations. Participants sat in front of the TV screen which displayed a typical office environment resembling a conference room and stated, “begin simulation” and later “end simulation.” Participants engaged with the on-screen live avatar who performed as a parent in semester one and as a teacher in semester two. The participants conducted the 15-20 minute simulation while their peers and mentors watched in the fishbowl arranged classroom and experienced approximately 15 minutes of debriefing following the simulation in two consecutive semesters of an academic year. In the second semester of the study, the final simulation was conducted wholly online in the Zoom conferencing platform due to social distancing related to Covid 19. However, within the Zoom format, the simulations and debriefings

were viewed by all participants, university mentors and the researchers as in the previous live performances within the simulation lab.

Sampling and Participants

A collective case study selects specific participants to understand various perspectives related to the phenomenon of study (Creswell, 2007). A purposeful sampling procedure was used (Creswell, 2007) to understand the perspectives. The total population of a group of EdD students ($n=6$) in an Instructional Leadership program also pursuing an add-on certification program for educational leadership at a public university in the Northeast of the United States were the sample. The first parameter to identify participants included membership in the educational leadership cohort involved in two seminar classes related to the clinical experience which had simulations as part of the curriculum. The second parameter was participation in the simulation laboratory focused on scenarios related to conferencing as an educational leader in two subsequent semesters in an academic year. While informed consent was acquired from all members of the course and from the university supervisor coaches— faculty assigned to individuals within the clinical component of their year-long fieldwork, who conducted the debriefings— only the students were included as participants in this research and the focus was on the student participants’ learning within the simulations as the phenomenon of study.

Demographics

Three male and three female Doctor of Education students in their third years of an Instructional Leadership program identified as white ($n=5$) and Blatinx ($n=1$) with an average of 11.3 years of teaching. Table 2 illustrates the demographics.

Table 2

Participant Demographics

Pseudonym	Total Years Teaching	Self-Identified Gender	Self-identified Race//Ethnicity	Educational Level for All Participants	Year in Program
Heather	10	Female	White	EdD student	3
Will	5	Male	White	EdD student	3
Deidre	14	Female	White	EdD student	3
Frank	8	Male	White	EdD student	3
Jay	17	Male	Blatinx	EdD student	3

Fiona 14 Female White EdD student 3

Data Collection

Data collection initiated in October 2019 and culminated in June 2020. There were three data sources: 1) video and live observational data of the simulations and after simulation debriefings; 2) reflections following the simulations; and 3) semi-structured interviews. Table 3 demonstrates the data sources as they relate to the research question.

Table 3

Research Question and Data Source

<i>Research Question</i>	<i>Data Sources</i>	<i>Per Participant</i>	<i>Total</i>
What are educational leadership students' perceptions of their learning and their development of conferencing skills as a result of the mixed reality simulation experience, which included performing the simulation, debriefing on the simulation and deliberating about the simulation?	Observations of simulations	2	12
	Written Reflections	2	12
	Interviews	1	6

Observations

Simulations and subsequent debriefings were initially observed live for each simulation and then later, were observed via the captured video. Following each simulation, the video data were uploaded into a Google Drive account. Figure 1 illustrates the screen within screen view used to capture the TV screen that displayed the adult avatar and the participant during the simulation, and the class and university supervisor observing the process from behind and from the sides of the laboratory classroom for the debriefing. As a result of the screen within screen observation data, researchers were able to see the participant and avatar simultaneously, noting both behaviors and reactions.

Figure 1
Recorded view of simulations in laboratory



(Gundel, 2018). Reprinted with permission.

A researcher-created observation protocol informed by the simulation rubric created for simulation observations (Piro, 2017) was used for observing the simulations and after simulation debriefings. We used the rubric to construct field notes on each participant and for every simulation and debriefing session to provide focus for data collection. The rubric identified and defined various performance and dispositional outcomes for the simulated conference such as developing an opening, gathering information, sharing information, making a plan, maintaining a positive relationship, accepting emotions, and maintaining meeting flow—all components of the simulation conference for both scenarios in the study. We added mentor and peer notes to collect data regarding the debriefing and reflective field notes as part of this data collection process. The protocol was used for the initial observation of the simulations and for the subsequent captured video observations. The observation protocol is depicted in Table 4.

Table 4

Observation Protocol

Performance Category	Criteria	Definition	Sample “Look-fors”	Mentor/Peer Comments	Reflective Notes
Behaviors	Opening	Candidate immediately establishes a context for the meeting.	<p>“The purpose of this meeting is...”</p> <p>“Today, we will be discussing...”</p> <p>“We are here today to review...”</p>		

Gathering Information

Candidate asks parent for pertinent information.

“What is your understanding of the situation?”

“What are your thoughts on your performance?”

“Is there anything else you would like us to address?” or
“Are there other goals you would like to see us address?”

“What worries you? What can I help you with?”

“Do you have any ideas about ways we can...”

Sharing Information

Candidate explains the situation from his or her point of view using evidence to support explanation.

“My concerns are...”

“I noticed that...”

“I’d like to describe my understanding of the issue. Can you confirm your understanding?”

Making a Plan/Problem Solving

Candidate suggests potential solutions to the situation while incorporating parent’s or teacher’s ideas if possible.

“Based upon our conversation today, a plan of action is...”

“I’d like to suggest some possible strategies...”

“Some learning opportunities here are...”

“Let’s make a plan of action together...”

“Let’s follow up on _____ to _____.”

Dispositions	Maintaining a Positive Relationship	Candidate is encouraging, friendly, and personable regardless of the parent's or teacher's behavior by showing appreciation for his/her efforts, using positive language, and creating rapport.	<p>"I hear how important _____ is to you."</p> <p>"You do _____ well."</p> <p>"I can see how you support your child/students by..."</p>
	Accepting Emotions	Candidate expresses empathy for parents' emotional state by listening carefully and empathetically and accepting emotions.	<p>"I hear how this could be difficult."</p> <p>"I understand your point of view."</p> <p>"I appreciate your willingness to try something new although it might be difficult."</p>
	Managing Flow	Candidate propels the momentum of the conversation by maintaining movement between each criterion. Keeps to allotted time frame.	<p>"Okay, let's move on..."</p> <p>"Very good. Now..."</p> <p>"Next let's discuss..."</p>

Piro, J. (2017). *Observational Protocol for Conference Simulation*. Adapted from Walker, J. & Legg, A. (2017)

Reflections

Video data of the simulations and debriefings were collected and sent from Google Docs via an email link for participants to view and analyze to create reflections. Twelve reflections of post-simulation reflections were collected. The reflections were written by participants following the simulation and debriefing each semester and subsequently, after viewing their own performance videos which were acquired by the screen-within screen video capture system. Each reflection asked participants to analyze the elements of the simulation and the debriefings and to set goals for future conferences. Reflections were typically four pages long.

Interviews

The semi-structured interviews were developed from a researcher developed protocol (Galletta, 2013) targeting liminality in learning. Following the year-long observations and reflection documents, the interview protocol addressed the emerging data analysis within the mixed reality simulations, the debriefings they received from their university mentor coaches and classmates, and their subsequent reflections. Six semi-structured interview data were collected from participants. The interviews lasted from 62 minutes to 90 minutes with an average interview time

of 68 minutes. Interviews were collected in the form of VoIP (voice over Internet protocol) conferencing services via Zoom.

Data Analysis

Thematic analysis (Braun & Clarke, 2012) was used for all three sources of data. Data analysis began with observations of the simulations and debriefings. Reflections were the second data source analyzed in each semester of the study and interviews were the final data source analyzed. Familiarization and deep immersion into the data occurred for each data source, including reading observational field notes, reflections, and interview data multiple times, writing reflective notes, writing researcher memos, and conducting ongoing data meetings (Braun & Clarke, 2012; Saldana, 2016). We worked systematically giving equal attention to each form of data and looking for relationships and patterns across the data sources (Braun & Clarke, 2006).

Manual coding of the observations and reflections included deductive codes related to the literature on liminal learning (Miles, Huberman & Saldana, 2014) and inductive codes, with *in vivo* initial codes connected to both (Miles, et. al, 2014), finally being reduced to categories and patterns (Saldana, 2016). A codebook containing each code and category was linked to actual participant words, ensuring that abstractions and reductions were explicitly grounded in participant utterances, adding trustworthiness through an ongoing data trail. Categories that were developed from the codebook were used to inform the interview protocol. Last, the data from the interviews were compared with the categories from the observations and reflections for relationships and commonalities (Saldana, 2009). The final step of data analysis was the development of four typical themes that represented all data sources and were representative of all participants, and these themes resulted in an overall finding statement. Table 5 demonstrates the data collection and analysis process.

Table 5

Data Collection and Analysis Process and Calendar

<i>Simulation 1</i>	<i>Debriefing 1</i>	<i>Reflection 1</i>	<i>Ongoing Data Analysis</i>	<i>Simulation 2</i>	<i>Debriefing 2</i>	<i>Reflection 2</i>	<i>Interviews</i>	<i>Data Analysis Concludes</i>
Review of videos and analysis began.	Review of videos and data analysis continued.	Review of reflections and analysis continued.	First and second level coding occurred.	Review of videos and data analysis continued.	Review of videos and data analysis continued.	Review of reflections and analysis continues. Codes from simulations, debriefings and reflections inform interview protocol.	Interview data further inform data analysis. Third level codes developed.	Finding statement and themes developed.
October and November 2019	October and November 2019	December 2019	December—March 2020	March and April 2020	March and April 2020	May 2020	May—June 2020	July 2020

The two adult avatars, Mr. Mullin (the parent-avatar) and George (the teacher-avatar), are named and designated within the findings with an asterisk to distinguish the avatar from the participants within text. Each data source is designated within the narrative following the quote or paraphrased material. An “O” demonstrates that the data came from observation one or two. An “R” demonstrates that the data source was a reflection, one and two. An “I” designates data emerging from an interview. Participant pseudonyms are also identified with the data source. Data sources and participants are noted in the finding narratives as illustrated in Table 6

Table 6

Notations of data source, participants, and avatars in findings

<i>Data Source</i>	<i>Observation of Simulation</i>	<i>Reflection after Simulation</i>	<i>Interview</i>
Designation in Narrative	O1 or O2	R1 or R2	I
Designation of Avatar with Data Source	*O-2-Mr. Mullin (parent avatar) *Ethan (student from scenario in semester 1 who had engaged in a fight.)	*R1-Mr. Mullin (parent-avatar)	*I-George (teacher-avatar)

Note: an asterisk * designates an avatar to differentiate with participant names within text.

Trustworthiness, Limitations and Conclusion

Institutional Review Board protocols were observed for this study. Credibility was established through prolonged engagement with the participants and data collection, over a full academic year. Data triangulation occurred with multiple forms of data— observations, reflections, and interviews— increasing credibility of this report (Creswell, 2013). A chain of evidence was used to establish dependability (Yin, 2009). Confirmability was obtained by detailing each step and procedure of the study (Lincoln & Guba, 1985). This study is specific to this study site and participants and does not attempt to generalize to other contexts. However, the study site is a CAEP accredited university and other universities with similar curricula using simulations for educational leadership preparation may find the results inform their own programming. Researchers had no instructional connections to the participants within this study. However, this research was conducted at the researchers’ university site.

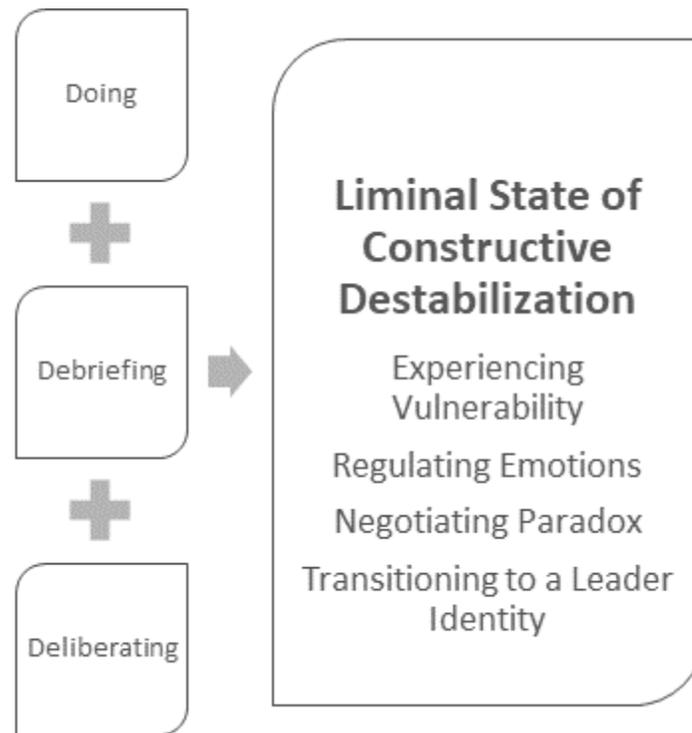
Findings

One finding statement with four related themes was developed. The finding statement was: *The doing of the simulations, the debriefing after the simulations, and the deliberating about the simulations led to a liminal state of constructive destabilization* (Kegan, Lahey, Fleming and Miller, 2014). Four themes supported the notion of experiencing constructive destabilization

within liminality: experiencing vulnerability, managing emotions, negotiating paradox, and transitioning to a leader identity. Figure 2 illustrates the findings.

Figure 2

Illustration of Findings



Liminal spaces are noted for their turbulence as former ways of knowing and one’s sense of identity is shed, leading to new roles and new skills. Liminality is a place of transformation and change; a state of between-ness and movement from the earlier self to a new and repositioned self (Meyer & Land, 2005). Previously, we suggested that liminality was a transition phase, one that occurred between the pre-liminal student identity state and the emerging leader identity (Piro & O’Callaghan, 2019b). Part of this shifting sense of identity as an educational leader involves a reconstitution of the self towards leadership as participants developed and acquired new knowledge (Meyer & Land, 2005). Change is troublesome. Though it moves the learner to a more complex position in the learning process, growth requires “challenges, perturbations and disruptions” (Doll, 1993, p.14). As part of this troublesome nature of learning within the simulations, the debriefings and later, as they deliberated on their performances and set goals to improve, the participants moved through a space of disequilibrium that, while it was uncomfortable, was manageable. We identify this sense of turbulence within the liminal moments of the simulation experience as constructive destabilization (Kegan, Lahey, Fleming and Miller, 2014, nd).

Constructive destabilization involves “being regularly, though manageably, in over your head” (Kegan, Lahey, Fleming and Miller, 2014, nd). It necessitates an acknowledgement of one’s inadequacies in performance, stretching one’s capabilities and finding oneself in a destabilized sense of identity. While the destabilization of one’s identity is difficult, it is also constructive, in

that recognizing the gap between one's performance and where one wants to be professionally can be diminished (Kegan, Lahey, Fleming and Miller, 2014, nd). The doing of the simulation in a fishbowl setting with peers and university supervisors watching the performance, the subsequent debriefing in front of the same, and the final deliberation on both, facilitated this constructive destabilization and provided development opportunities to demonstrate new capabilities. Participants experienced destabilization while performing the simulations and while receiving feedback in the debriefings, and even while reflecting at a later point. However, the three steps of the process—the doing, the debriefing and the deliberating—also served to construct and restore equilibrium and to develop leadership behaviors. Doing, debriefing and deliberating the simulations were both destructive and destabilizing *and* constructive and stabilizing. We suggest that constructive destabilization is a liminal process. Liminality through constructive destabilization was identified through four themes: experiencing vulnerability, regulating emotions, negotiating paradoxes, and transitioning to a leader identity.

Experiencing Vulnerability

The notion of vulnerability within pedagogy—experiencing challenges and difficult emotions within the classroom—has been suggested to enhance teaching and learning (Brantmeier, 2013; Booth, 2012; Thompson, Moss, Simkins & Woodruff, 2019). To experience vulnerability is to be “open to criticism or attack” (Cloud, 1992, p.95). Vulnerability is having the courage to show up and be seen despite emotional exposure and risk; vulnerability allows students to be curious and explore more of who they are or are becoming (Brown, 2017; 2018). Vulnerability was experienced by participants in the initial performance of the simulation and the subsequent debriefing, and even in the viewing and deliberating of their performances at a later time.

Performing the simulation—the doing of the conference simulation—was the first area of vulnerability. Participants, within a fishbowl classroom structure, performed the conferencing simulations in front of classmates and university peers; in effect, these performances and feedback sessions were not private learning formats, but social learning events. Learning to be comfortable, to make mistakes, to operate and problem solve, to be responsive to the avatar emotionally and also accomplish the content within the confines of the scenario expectations, was enormously risky for participants. Yet, without the risk of the performance and the subsequent possibility of making mistakes, there would be little growth and development of new skills.

Secondly, participants received feedback through a debriefing session immediately following the performance of the simulation, and that feedback was given within the group dynamic of classmates and university supervisor mentors. Unlike private feedback sessions, these debriefings were provided to the individual participants within this group dynamic.

Last, it was during the video analysis and reflection where participants re-lived their doing and debriefing of the simulation and it was through their deliberations—reflecting upon the simulation experience and debriefings— that vulnerability was experienced one last time. The doing and the debriefing of the simulations were captured on video and sent to the individual participants so that their deliberations about the video, while done privately, highlighted the social nature of their learning. Deliberating on the video performance of the simulation and debriefing resulted in reflections that demonstrated vulnerability as part of participants' destabilization and reconstitution within the liminal space of the simulation experience.

Jay noted upon analysis of his video that doing the simulation in front of others was “cringeworthy.” In his second reflection, he stated, “As I was laying out the post-observation

agenda, I was bombarding him [the avatar] with so much information, when I was done with my unintended monologue, *George did not know how to respond, and simply said, ‘Was that a question?’” Jay reflected that another “cringeworthy” moment was when he spoke over the avatar during the conference. “ *George was explaining his rationale for the lesson, and I rudely interrupted and asked, ‘Can you be specific?’” A peer provided feedback to him in the debriefing that he had interrupted the teacher-avatar in the conference and suggesting to Jay that he may want to consider giving the teacher-avatar a bit more space to elaborate. After watching the video and within his second reflection, Jay “re-lived” his mistake. “I am aware of this impolite habit of speaking over a person. *George got the impression that his reflection was insignificant to our conversation. Again, this is not the best way to establish a caring relationship with a colleague.”

Discussing his debrief (I), which he said, “did not go well,” when peers and his university supervisors made suggestions, Will admitted that being in the educational leadership cohort was wonderful but that there was an added pressure to being in the fishbowl lab and having others give immediate feedback on his performance in the simulator. He related that he was immersed in the simulation while it was occurring but that he was always aware of the others around him in the lab. Later, upon watching his video, Will related his intense reaction to watching the simulation and debriefing again. He admitted to his palpable vulnerability. “My human reaction was I want to run away and curl up in bed” (I). Later, as he watched his video when he already knew the mistake he had made previously in the simulation, he added, “ I am watching it unfold. I want to grab myself and say, ‘no don’t do that’” (I).

Yet, these moments of vulnerability and the destabilization that occurred as a result of deliberating also led to a constructive outcome and to a deeper understanding of an emerging leader identity. Jay realized that the simulations allowed him to reflect upon his craft. Speaking about his performance, Jay said, “Whether I winced when I saw myself talking over *George, or when he took out his mobile phone to program the meeting dates, the simulation gave me feedback. Feedback is a form of care.” He added that when his peers provided insight into areas of development, this insight advanced his leadership style to be able to foster future authentic relationships with colleagues and students. His vulnerability, to perform and to hear the debriefing in front of his peers and university supervisors, led him into a sense of destabilization, but he emerged with a deeper sense that the feedback was a form of care that he would not have received without the experience. Mentioning the Johari Window, developed by Luft & Ingham (1961) which allows people in groups to understand and enhance communication and to increase self and other perceptions, Jay stated, “Feedback is source of professional growth because it provides information about areas of strengths, needs, and Johari blind spots.” In effect, Jay’s sense that the feedback was caring assisted him to reconstitute the experience and reconstruct a more growth-oriented view on his vulnerability.

Will also mentioned the growth that occurred through experiencing vulnerability as a result of doing the simulation and debriefing with colleagues. “The thing about the simulations is that without them, you might never find out what was misread, misunderstood. Never find out if your intentions were conveyed” with the avatar (I). Additionally, the value of the debriefing, though difficult, helped him push through his sense of vulnerability. After a difficult simulation and knowing that his debriefing was up next, Will later reflected that “Here at this university, we finish that thing. You have to turn around and face immediate feedback” (R2). Regarding the debriefing, Will stated, “Having to sit there and face it, it is a good leadership practice. You have to face the criticism. Even if you know there will be criticism— you hear it and you hear some alternatives” (I). Further, Will related that having his classmates around him during the simulations was how

real leaders would be in a real context, that the words he said were consequential within the simulation just as they were in real life. “The words you say are meaningful, in the real world you must be in the moment.” He added, “All the eyes are on oneself just pushes you to be more accountable to what you say in the moment [in the simulations]. Once you make a statement it is live; it is real. It is important because it is reality” (I).

Participants experienced vulnerability as they performed the simulations. Additionally, they became comfortable with mistakes and critiques during debriefing. Last, participants relived their vulnerability as they viewed videos of their simulations sessions and deliberated on their own performances. Yet, these moments of vulnerability and their disruptive and troublesome nature led to a reconstitution of the experience and subsequently, growth toward their emerging leader identities.

Managing Emotions

Being able to self-regulate and manage others’ emotions, evaluating strategies to maintain or change an emotional response and monitoring emotional states are all processes of emotional regulation (Mayer, Caruso, & Salovey, 2016; Mayer, Salovey, & Caruso, 2008; Mayer, Salovey, & Caruso, 2004). Further, managing one’s emotions requires staying open to both pleasant and unpleasant feelings to learn and adapt one’s own behaviors (Mayer, et al., 2016).

Simulation one was designed so that the participants would need to deliver the difficult news to the parent-avatar that his son, *Ethan, would need to be suspended for fighting per the school policy. The parent-avatar, *Mr. Mullin was confused, sarcastic and even angry when participants delivered the news. Yet, as part of the expectations of the simulation, the participants needed to continue the conference by developing a collaborative plan of action with the parent-avatar and maintaining a professional and respectful demeanor. Each of the participants recognized his or her own emotional reactions as a result of the difficult conversations. Deidre acknowledged that she needed to stop avoiding conflict as an educational leader. She stated, “I need to be a little more assertive; confrontations are definitely not something I enjoy and therefore, I avoid them” (I). However, from the simulation, Deidre also realized that calmly redirecting the conversation toward a resolution was a skill that she hoped to practice and acquire. (R1).

Heather sighed heavily when discussing the debriefing sessions. “It was stressful. But such a valuable experience. More people should have access in how to stay calm, focus on the conversation goals, remember who it is supposed to be about” (I). Yet, the anxiety of going through the simulation and debriefing had its upside—growth. “Despite all the anxiety I would do it again in a heartbeat. It was the perfect set-up for getting what we needed. Watching everyone, watching ourselves” (I).

Frank reflected on his own and the avatar’s emotions when he considered feedback from his debriefing (R2). “I have to remember that it is okay to drive an uncomfortable point home without worrying about hurting someone’s feelings. As a school administrator, I have to be able to deliver tough news in a timely and effective manner so that students are receiving the best education possible.” He continued, “I do not want to build the reputation of being a ‘nice pushover.’ I want to be respected and taken seriously as an administrator and teacher leader. I should not be worrying about getting to an unpleasant situation.” Frank continued to discuss his emotional reactions within the debriefing of the simulations. “I think that in the moment, the critiques felt like a gut punch. In the moment of the debriefing, the critiques destroyed me” (I). Having reflected upon the debriefing, Frank was able to add some perspective. “In hindsight,

I am so glad I got some negative critique. We are fearful of gut punching each other and that reciprocity—you might get that back yourself” (I).

During simulation one, the avatar-parent was agitated that *Ethan would need to be suspended for fighting. However, because of Heather’s strong opening and calm manner, the parent-avatar appeared to understand, then acquiesce. Heather stated that she had conducted a thorough investigation and spoken with *Ethan and other students and that *Ethan was forthright and honest about what occurred. She told the avatar-parent, “Kids make mistakes. We want to keep *Ethan moving forward” (O1). By acknowledging that she took the perspective of helping *Ethan to grow and move on, she was able to keep the avatar-father calm and rational and these dispositions seemed to lessen his agitation (R1). Later, Heather recognized how difficult these processes were when she wrote, “I think that the most challenging part of contentious meetings for me will always be to not take things personally and to remain calm and professional” (R1).

Fiona was conscious of her own emotions when the parent-avatar made sarcastic remarks to her in simulation one. “*Mr. Mullin referred to school disciplinary policies as things that people have never read before.” Fiona continued, “I was aware of his snarkier comments, his sarcasm and my emotional response” (R1), but calmly stated, “We offer you the same confidentiality that we offer all students and parents. Confidentiality is non-negotiable” (O1). Fiona reflected that her intuition was to accept the parent-avatar’s anger, and to use the words, “I understand your surprise. I understand your anger. I hear that from you” (R1). In the debriefing following the simulation, peers noted that she had validated *Mr. Mullin’s emotions with her comments. This validation had the effect of disarming the parent-avatar’s anger leading to a problem solving stance (O1).

Will deliberated upon his intentional change in emotional regulation with the simulation in semester two. “As opposed to the previous simulation, where I was nervous, hesitant, and rather defensive, I decided to approach this scenario in a more collegial and friendly manner” (R2). He found this simulation more natural and successful in that he maintained a positive and friendly demeanor. However, watching the video provided less comfortable emotional reactions. Will described watching his video of the simulation and debriefing as “cringey.” “It is difficult to watch yourself. All the emotion rushed right back to the surface” (I). Will admitted that he had a visceral reaction to the avatar. Will had watched the avatar engage with his classmates and he found him to be irritating. “I felt inferior, intimidated, a little angry because I watched him give a hard time to my loved peers” (R2). But, with his second simulation, he managed his irritation and evidenced a professional disposition. “I flipped it. I had to manage disgust. That was the reality. You won’t like every parent or teacher. I had a set of goals to accomplish” (I). Will added that it was the protocol (the written scenario and rubric) that “saved the day.” “Sticking to the plan, where you are going, the goals, this needs to be accomplished. So being angry was not going to help me get to them. That helped me manage my emotions. I had a place to go” (I).

The nature of the public performance of the simulation within the classroom lab and the subsequent debriefing in the same setting seemed to have amplified the emotional discomfort of participants. Additionally, participants reflected that the subsequent viewing of their simulations and feedback produced further stress and anxiety. Yet, the heightened emotional reactions preceded and guided participants into regulation of their own emotional state and also helped them to assist the avatars’ emotional responses within the simulations.

Negotiating Paradox

Simulations that resulted in successful problem solving required planning *and* flexibility. Planning is a hallmark of leadership (Kaufman, 1992), as is both behavioral and cognitive flexibility (Mumford & Connelly, 1991; Reiter-Palmon, 2003; Zaccaro, 2002). Being able to both plan for the simulation and remain flexible to adapt during the simulations suggests that negotiating this paradox was a key component of participant's experiences. Managing paradoxical tensions demands that leaders appreciate that both polarities are achievable and negotiating paradoxes may lead to improvement in performance and learning (Lavine, 2014; Waldman, Putnam, Spektor, & Siegel, 2020).

It was through the experience of the simulation, the debriefing, and reflective deliberation that participants recognized a learning paradox—the need to both plan for the conference and to be in the moment, to improvise and to remain flexible. Frank was a planner but stated he was not proficient at improvising. “The simulations helped me to remember to stay in the moment as best I can. The practice of being in the moment will allow the creative problem solving to occur” (I). He reflected that the debriefing from his university mentor helped him. During debriefing, the mentor had suggested that Frank should allow himself to pause, to collect himself, and only then to respond (R2).

Deidre reflected that planning for the conference, especially knowing school policy, was paramount.

There were a few instances where I felt unprepared to answer the question and then, the avatar jumped right in. This was a particularly valuable lesson for me; you certainly don't want to give the parent the idea that you don't know what you are talking about. In a real parent meeting, I would now know to take a quick look back over school policy and any information I had on an incident before the meeting started (R1).

Yet Deidre also recognized the importance of improvisation within the simulated conference when she stated that “Having an agenda for the meeting while still remaining open and flexible will help to ensure that things don't drag on our get out of hand” (R1).

Jay discussed his use of his paradox of planning and improvising when he stated he wanted to be present in the moment to receive information from the avatar. “Nel Noddings calls it motivational displacement. Even if you have an agenda, you displace your motive so that you are ready to receive” (I). Being present to hear the actual words and intentions of the avatar was part of connecting with people. He continued. “Be ready for displacement of yourself in case you get a new issue that must be addressed for that moment. You don't prepare for the obvious, but for the unexpected” (I).

Fiona described herself as a habitual planner who would plan her way through the principal/parent conference (R1). She entered the simulation with a set of prepared notes and an agenda to share information and plan with the parent-avatar per the simulation rubric. She assumed the agenda would be a clear way to establish the shape of the conversation. In debriefing, a classmate provided feedback that the planned conference, while organized in that Fiona clearly outlined the steps for *Ethan's suspension, was a bit “too intense” for the situation (O1). Later, Fiona recognized the organic nature of the conferencing and that she would be called upon to “engage in improvisation” in future conferences, to balance the planning she had developed prior to the simulation (R1).

Will intentionally began his second simulation, the teacher post-observation conference, with some looser guidelines, while still attempting to achieve all the steps of the conference. He

asked *George to provide him with the goals for the lesson he had taught to gauge the teacher-avatar's assessment of his own classroom activities. He felt that having the teacher acknowledge his own challenges and then using that as a platform for constructive dialogue was more useful than introducing the teacher's challenges void of his own reflection (R2). However, upon video analysis, Will noted his lack of inquiry and specificity with the teacher/avatar. Will felt he rushed the planning part of the conference and that he had hurried through this portion of the scenario, wrapping it up without coming to clear closure with the teacher-avatar. He wished he had followed up on *George's self-perceptions. Later, he felt similarly when he "shortchanged the teacher and me by not making a clear plan" (R2). Will's reflection seems to indicate that he had purposefully planned for a more improvised conference with the teacher, but that he may have planned more concretely for certain parts of the scenario—specifically, by allowing the teacher to disparage the initiative for more student talk in the classroom per the scenario but then, by not following up with specific plans for future implementation of the initiative, that he may have been too flexible with the teacher (R2). In debriefing, a classmate asked Will if perhaps he should have been more structured with the teacher when providing feedback by suggesting that increasing student talk was a school initiative (O2). Will later reflected that "I could have struck a stronger balance between listening to the teacher and affirming his concerns, and also advocating for an initiative that had been vetted by the faculty" (i.e. increasing student talk in the classroom) (R2).

Learning to negotiate the paradox of planning and remaining flexible within the simulations was a common experience of the participants. Transforming the opposing polarities of planning/flexibility to be simultaneously achievable goals helped them to develop generative options for their emerging leader identities.

Transitioning to a Leader Identity

Developing a new identity involves understanding one's conflicting and diverse lived experiences to create a sense of a coherent self (Ricoeur, 1991; Tracy & Trethewey, 2005). Developing and adopting a leader identity is a central process of becoming a leader (Ely, Ibarra, and Kolb, 2011). Shaping one's leader identity requires a personal identity transformative process involving the incorporation of leadership as part of one's self-concept (Richardson & Loubier, 2008). Professional identities, such as educational leader identities, include the development of professional norms and values integrated into the personal sense of self (Ng, Nicholas & Williams, 2010; Schlomo, Levy & Itzhaky, 2012). Transitioning to a leader identity as a part of the doing, the debriefing and the deliberating of the simulations was a fourth theme of this study. We recognized emerging leader identity with participants in several ways: focusing on students to make decisions and to communicate; using leader language; and problem solving in the moment of the simulations.

Progressing from a teacher to a leader identity was difficult work. Fiona described the doing of the simulations as an amplifier of her transition to a leader identity. "I was coming at the simulations with so much doubt. If I failed at them, then this might be a sure fire sign that I am not cut out to be an administrator" (I). This notion of self-doubt in her emerging leader identity seemed to be intensified while performing in the simulation. However, Fiona said that experience of trying on the leader identity "was a valuable experience for me. I saw it as an opportunity to learn more about myself" (I).

One focus for an emerging leader identity from the simulation experience was noted when participants explicitly acknowledged the use of mission to guide their choices within the

conferences, and specifically, to be student-oriented in their conferences. When asked about simulation two, Heather stated how she managed the confrontation with the teacher-avatar. “Focusing on students, using that as a way to keep meeting positive” (I). On follow up, she reflected that this approach was true for simulation one, as well. She stated that the debriefing had helped her to be aware of her tone of voice, her body language. Peers also suggested she focus on students (O1). “For simulation one, keeping the focus on the student with the parent was important. This is why we are here, make things better for the student. Common ground and go from there” (I). The feedback Heather received following the debrief in simulation two also helped her to remain student focused. She stated she was mindful of focusing on student learning with the teacher-avatar (R2). Her goals for simulation two were to “Focus on the student. Help the teacher-avatar to come to his own conclusions. To guide him so that he had ownership of the ideas” (I).

Deidre used students’ needs to guide her plan of action in simulation one and to provide feedback during the debriefing with Heather. During debriefing (O1), Deidre provided feedback to Heather that recognized her efforts, despite the contentious conference, to stay focused on the student, *Ethan. “You continued to come back to *Ethan in terms of services so that *Ethan would not be penalized academically.” Later, Heather acknowledged the debrief, saying “Keeping focused on the student is a piece of advice I will always remember. Even in a suspension meeting, the student’s needs should be paramount” (R1).

Participants’ use of language was another identifier of an emerging leader identity. Frank acknowledged a change in language and how that language helped him to identify as a leader. “Even the prep for the simulation helped to change my thinking, my identity. How am I going to think about this scenario? It is not just thinking as an educator, but as a leader in the school” (I). His language transformation was evident in the way he described what was important for each scenario. “Uphold safety, rapport, standard, confidentiality in the first scenario to a more extreme level as the leader; With scenario two, it was more about rigor, rapport, high expectations of teacher and learners” (I).

Problem-solving in the moment was another indicator of an emerging leader identity (Piro & O’Callaghan, 2019). Problem-solving in the moment was a difficult disposition to acquire. During the second simulation, Deidre acknowledged areas of improvement in her performance upon reflection. Her performance and debriefing upon video analysis captured her mistake, upon which she later reflected. “One mistake I made during the session was bringing up the other students involved in the incident. The avatar kept bringing up the other participants (as I am sure parents do in real situations) and I fell for the trap” (R1). Deidre’s reflection notes the significance of problem-solving within the simulation as an educational leader

In the debriefing following a simulation where the avatar-parent was upset that Heather would be suspending his son for fighting, Heather problem-solved in the moment by keeping the avatar-parent focused on policy, rather than the fight and who was at fault (O1). Heather spoke to the parent avatar about the school policy for fighting and explained that finding fault was not the main driver of the consequence. The problem was being involved in the fight. Heather focused on the school policy, not on finding fault. In the debriefing, a peer noted Heather’s choices. “It is interesting how you separated fault from involvement in the fight. You framed the suspension as an opportunity for *Ethan to think about what happened. It gave meaning to the suspension as restorative rather than a punishment” (O1).

Developing a leader identity is part of the transformative process of self-change and self-appraisal for people moving from teacher to leader roles in schools. Participants changed their personal views of themselves as they practiced leadership skills in transit to a new group

membership of educational leaders (Keefer, 2015; Kiley & Wisker, 2009, 2010). Doing the simulations, receiving a focused debriefing, and deliberating on their performances required the participants to tackle the doubts about the practice of leadership (Hawkins & Edwards, 2017) as they developed a new identity as a school leader.

Implications and Recommendations

Liminality is “a transformative state in the process of learning,” (Land, Rattray, & Vivian, 2014, p.201) which— by prompting learners’ understandings of themselves and their identities, their assumptions and values, and their cognitive grasp of concepts— may have both cognitive and affective implications (Rattray, 2016). Within the process of liminality, individuals forge new identities while their cognition and skills are transformed (Piro & O’Callaghan, 2019). This process of transformation is a turbulent one in that emerging school leaders must navigate their emotions as they shed identities as classroom teachers and construct new identities as leaders (Rattray, 2016). It may be easier to understand the liminal moment in simulation learning by understanding what it is not. It is not stable or fixed; it may even be turbulent. But, this instability provides the catalyst for growth and change. The mixed reality simulations provided the space for destabilizing ways of being and the reconstructing a newer leader identity.

The doing of the simulation, the subsequent debriefing, and the final deliberation enabled constructive destabilization within the liminal space of learning and provided development opportunities to demonstrate new capabilities and skills. Constructive destabilization within the simulation experience may be considered to be deliberately developmental (Kegan, Lahey, Fleming and Miller, 2014, nd). Within the simulation experience, participants experienced a destabilization process and then reconstituted their newer, developed sense of leader identity within the liminal learning space. People grow through both challenge and support (Kegan, Lahey, Fleming and Miller, 2014, nd). A deliberately developmental process acknowledges personal growth through turbulence and provides a safe place for passing through the difficult liminal state.

During the doing of the simulation and the subsequent debriefing, and even in the viewing and deliberating of their performances, participants experienced times of vulnerability. Judith Butler (2004, 2009) investigated *corporeal vulnerability* as the vulnerability of the human body; that others respond and react to the human body itself, but that some individuals are not affected by this corporeal vulnerability to the same extent as others. Vulnerability may be situational (Mackenzie, Rogers & Dodd, 2014). The simulation experience creates this situational form of vulnerability. The public performance of the simulation and the very essence of feedback within debriefings gives rise to a situated corporeal vulnerability.

Adopting vulnerability as a lens through which to understand student performances within mixed reality simulations may help programs to understand the connection between continuing to learn within the personal and social risks of the simulation experience, as well as the emotional volatility that occurs. Vulnerability is also relational (Goodin, 1985). Helping students to understand what makes them vulnerable and to whom and helping them to cope through the vulnerability of the simulation experience through strategies that suggest ways to deal with the challenges of stressful events (Moos & Billing, 1982) may assist them to cope with this inherent vulnerability. These strategies might involve seeking support from peers and mentors; discussing emotions with mentors or counselors; or journaling or using reflective processes such as the ones used in this study. Even avoidance strategies, such as using distraction by engaging with one’s friends or taking the time to do activities of interest, may help to decrease vulnerability and stress associated with the simulations.

Programs can use the vulnerability lens to develop strong debriefings, as well. The actual simulation performed, and the debriefing in front of peers and mentors, generates risk to one's reputational areas and exacerbates this vulnerability. At the highest level of debriefings (Dismukes & Smith, 2000), the facilitator is the catalyst for change by asking open ended questions and then by using silence to develop student initiated problem-solving. Educational leadership students may create their own goals for change, leading to agency and fewer feelings of vulnerability as a result of this deliberation process. Future research might investigate this highest level of debriefing and which coping strategies most help students to understand and negotiate the vulnerability they experience while learning to conference in simulations.

Participants experienced strong emotions and learned to regulate those emotions as part of the simulation experience. Emotional regulation involves managing one's and other's emotions, evaluating strategies to maintain or change an emotional response, and monitoring emotional states. Emotional regulation may be both automatic and conscious and effortful (Gross & Thompson, 2007). Through cognitive reappraisal, educational leadership students might employ conscious emotional regulation experience by intentionally changing their thinking to re-consider an emotional situation from the simulation or debriefing, and then, to decrease its emotional impact (Lazarus & Alfert, 1964). Learning to be aware of one's emotions and how one regulates those emotions during the simulation experience, perhaps through a mindfulness intervention, may be a deliberate effort by programs to encourage the understanding of emotional states and ways for students to use cognitive reappraisal methods.

For example, Cristea, Szentagotai Tatar, Nag, & David (2012) described having students watch an emotionally upsetting video and then practicing a reappraisal method to help them to foster their own emotional regulative functions. In the case of simulations, programs might similarly offer videos of previous simulations for students to consider possible dysfunctional emotions that may arise in the performance of future simulations. Dysfunctional emotions, which are self-defeating, may be reappraised to more functional emotions, "which would still allow the person to engage in goal-directed behavior, albeit experiencing psychological discomfort" (Cristea, et al. 2012, p. 551).

Additionally, to foster educational leadership students' sense of well-being through emotional regulation, programs might provide continued mentoring, both during debriefing of simulations, but also as part of the deliberation process. After students view the simulation experience, mentors might inquire "What sorts of feelings emerge from this simulation? How might these feelings change over time" (Mayer, Salovey, & Caruso, 2008). These questions allow using difficult emotions to facilitate thought and plan for future simulations. Finally, programs might focus on increasing awareness of *emotional display rules* as leaders within difficult conferences (Ekman & Friesen, 1969), which are "the need to manage the appearance of particular emotions in particular situations" (p. 137). Display rules may encourage or discourage leadership students to experience or express emotions (Isenbarger & Zembylas, 2006) following simulation experiences, especially within the deliberation stage. Emotional regulation interventions (Gross, 1998) may help students to reinterpret the emotions they experienced during the simulation to better understand challenging situations, such as those they experience conferencing with parents and with teachers, to become goal-directed even when they are experiencing psychological discomfort (Cristea, et al, 2012). Future research geared toward emotional regulation interventions would determine those that have the most impact on educational leadership students working within simulations.

Participants used successful problem solving that required planning *and* flexibility. The paradox between planning and improvisation demonstrated cognitive flexibility (Spiro & Jehng, 1990). Cognitive flexibility is “the ability to spontaneously restructure one’s knowledge, in many ways, in adaptive response to radically changing situational demands” (Spiro & Jehng, 1990, p.165). The ability to hold paradoxes simultaneously and continue to function resonates with the notion of complexity leadership, where leaders learn to manage uncertainty and to resonate to respond to new conditions as they arise (Friedrich, 2010; Suedfeld & Grannatstein, 1995; Waldman & Bowen, 2016; Waldman, Putnam, Miron-Spektor, & Siegel, 2019).

A polarity management model (Johnson, 1992; 1998) helps educational leaders to understand paradoxes that require ongoing negotiation. Developing a polarity management mindset may help prospective educational leaders to navigate contradictory outcomes within the mixed reality simulations and then, to transfer that mindset into practice as a leader. Teaching divergent thinking and cognitive flexibility for the simulation outcomes as an explicit objective when introducing the simulations may encourage learners to value paradoxical goals and processes. Helping students to identify areas of the simulated conference that are necessarily paradoxical, such as achieving focused planning and also expecting to use flexibility within the simulations, by holding discussions about ways to achieve both sides of the paradox will likely encourage this form of cognitive flexibility about the simulations. Research on leadership paradox within simulations is a viable next step for making explicit cognitive flexibility and polarity management strategies within simulations.

Participants experienced emerging leader identities by focusing on *students* to make decisions and to communicate, using leader language, and problem-solving in the moment of the simulations. Educational leaders must believe that every student can succeed as part of their professional mission and nurture that belief with others (Skrla, Scheurich & Johnson, 2000). Just as effective school leaders help other educators prioritize and choose the most successful strategies for their students (Ragland, Asera & Johnson, 1999), participants in the mixed reality simulations helped the parent-avatar and teacher-avatar focus on what was best for the *students* involved in their conferences. When the discussion became difficult, focusing on students and using student-focused language to facilitate the decisions provided the connection to communicate what was most important and to continue problem-solving with the avatars. This focus on the students typifies the type of complex processes involved in adopting the norms of the profession of educational leadership (Ng, et al. 2010). A transformed sense of leader identity appeared to emerge from the successful combination of student focus, use of language, and problem-solving within that student-orientation.

An implication for educational leadership programs is that helping students to learn to conference with adults is challenging and if the focus is on navigating difficult conversations as they were in this study, a strategic remedy is to focus on students and student learning as beginning and ending points, and additionally, when the conferencing becomes difficult or when opinions diverge. Using rubrics with clearly prescribed elements that expect leadership behaviors such as rapport building, involving others within the plan of action and accepting emotions, all with a focus on students will likely nurture successful educational leadership conferences. Similarly, curricular emphasis on leader mission, visioning and student-orientation used within educational leadership courses will hold value for students working within simulations as they learn to conference and develop a leader-identity.

In line with the notion of liminality as a state of *betweenness*—in this study, between student and educational leader identities— participants negotiated the leadership skills of

conferencing as they experimented with new versions of the leader self (Beech, 2011). Furthermore, the idea of *becoming* an educational leader, being in transition as participants took on new roles of leadership, arose in the findings. Traversing the liminal space is challenging. We found that participants experienced constructive destabilization during the process. The themes of vulnerability and emotional regulation suggested a certain fragility to the process. Programs must guide students through the turbulence of the liminal learning space (Piro & O’Callaghan, 2019b; Rattay, 2016) or they may be tempted to abandon their emergent identities as educational leaders due to the challenges that are inherent in the mixed reality simulations.

Conclusion

The mixed reality simulation experience fostered cognitive shifts toward leadership thinking and skills within a community of learners who were bound together through a challenging liminal passage. Participants within the simulation experience experienced constructive destabilization (Kegan, Lahey, Fleming and Miller, 2014) within this liminality and negotiated this disequilibrium to develop new concepts, skills, and attitudes (Reams, 2017). The mixed reality simulations provoked vulnerability, difficult emotions and paradoxes that participants negotiated toward an emerging leader identity. Yet, navigating this turbulence was the necessary process toward a reconstituted self. The process of journeying through this liminal state of constructive destabilization was necessary to facilitate growth and leadership development. Constructive destabilization may be a perennial liminal state for all leaders—there are always incidents or issues that arise that are unplanned, unparalleled, and emotionally challenging within an educational leader’s professional experience. The 3D’s of doing, debriefing, and deliberating within the mixed reality simulation experience may provide future educational leaders with a cognitive method to foster meaning-making and cognitive modifications (Reams, 2017) through constructive destabilization as they shift their identity from teacher to leader.

References

- Beech, N. (2011). Liminality and the practices of identity reconstruction. *Human Relations*, 64(2), 285-302.
- Booth, M. (2012). Boundaries and student self-disclosure in authentic, integrated learning activities and assignments. *New Directions for Teaching and Learning*, 131, 5-14.
- Bradley, E. G., & Kendall, B. (2014). A review of computer simulations in teacher education. *Journal of Educational Technology Systems*, 43(1), 3-12.
- Brown B. (2017). *Rising strong how the ability to reset transforms the way we live, love, parent, and lead*. New York: Random House Inc.
- Brown, B. (2018). *Dare to lead: Brave work, tough conversations, whole hearts*. New York: Random House LLC.
- Brantmeier, E. (2013). Pedagogy of vulnerability: Definitions, assumptions, and applications. In Lin, J., Oxford, R., & Brantmeier, EJ, *Re-Envisioning Higher Education: Embodied Pathways to Wisdom and Transformation*. Charlotte, NC: Information Age Publishing,
- Braun, V. and Clarke, V. (2006) *Using thematic analysis in psychology*. *Qualitative Research in Psychology*, 3 (2) 77-101.
<http://www.informaworld.com/smpp/content~db=all~content=a795127197~frm=titlelink>
- Braun, V., & Clarke, V. (2012). Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbooks in psychology. APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological*. 57–71. Washington, D.C.: American Psychological Association.
- Butler, J. 2004. *Precarious Life: The powers of mourning and violence*. London: Verso.
- Butler, J. 2009 . *Frames of war: When is life grievable?*. London: Verso.
- Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches*. Los Angeles, CA: SAGE Publications.
- Cook-Sather, A., & Alter, Z. (2011). What is and what can be: How a liminal position can change learning and teaching in higher education. *Anthropology & Education Quarterly*, 42(1), 37-53.
- Cristea, I. A., Szentagotai Tatar, A., Nagy, D., and David, D. (2012).The bottle is half empty and that's bad, but not tragic: Differential effects of negative functional reappraisal. *Motivate. Emotion.*(36), 550–563.doi: 10.1007/s11031-012-9277-6
- Dalgarno, B., Gregory, S., Knox, V., & Reiners, T. (2016). Practising teaching using virtual classroom role plays. *Australian Journal of Teacher Education*, 41(1).
doi:10.14221/ajte.2016v41n1.8
- Day, D. V., & Dragoni, L. (2015). Leadership development: An outcome-oriented review based on time and levels of analyses. *Annu. Rev. Organ. Psychol. Organ. Behavior*.2(1), 133-156.
- Decker, S., Fey, M., Sideras, S., Caballero, S., Rockstraw, L., Boese, T., Borum, J. C. (2013). Standards of best practice: Simulation standard VI: The debriefing process. *Clinical Simulation in Nursing*, 9(6), S26-S29.
- Dieker, L. A., Kennedy, M. J., Smith, S., Vasquez III, E., Rock, M., & Thomas, C. N. (2014). *Use of technology in the preparation of pre-service teachers* (Document No. IC-11). Retrieved from University of Florida, Collaboration for Effective Educator, Development, Accountability, and Reform Center website:
[203](http://ceedar.education.ufl.edu/tools/innovation-configurations/Dieker, L. A., Kennedy,</p></div><div data-bbox=)

- M. J., Smith, S., Vasquez III, E., Rock, M., & Thomas, C. (2014). Use of technology in the preparation of pre-service.
- Dieker, L. A., Rodriguez, J. A., Lignugaris/Kraft, B., Hynes, M. C., & Hughes, C. E. (2014). The potential of simulated environments in teacher education: Current and future possibilities. *Teacher Education and Special Education, 37*(1), 21-33. Retrieved from ERIC database. (EJ1020586).
- Dieker, L. A., Straub, C. L., Hughes, C. E., Hynes, M. C., & Hardin, S. (2014). Learning from virtual students. *Educational Leadership, 71*(8), 54-58. S
- Dismukes R, & Smith G. (2000). *Facilitation and debriefing in aviation training and operations*. Aldershot; UK: Ashgate.
- Doll Jr, W. E. (1993). Curriculum Possibilities in a ' Post'-Future. *Journal of Curriculum and Supervision, 8*(4), 277-92.
- Ekman, P., and Friesen, W. (1969). The repertoire of nonverbal behavior: categories, origins, usage, and coding. *Semiotic. (1)*, 49–98.doi: 10.1515/semi.1969.1.1.49
- Ely R.J., Ibarra H and Kolb D (2011) Taking gender into account: Theory and design for women's leadership development programs. *Academy of Management Learning and Education 10*(3): 374–93.
- Fanning, R. & Gaba, D.M. (2007). The role of debriefing in simulation-based learning. *Journal of the Society for Simulation in Healthcare, 2*, 115-125. DOI: 10.1097/SIH.0b013e3180315539
- Friedrich, T. L., Mumford, M. D., Vessey, B., Beeler, C. K., & Eubanks, D. L. (2010). Leading for innovation: Reevaluating leader influences on innovation with regard to innovation type and complexity. *International Studies of Management & Organization, 40*(2), 6-29. doi: 10.2753/IMO0020-8825400201
- Galletta, Anne. (2013). *Mastering the semi-structured interview and beyond: From research design to analysis and publication*. New York, NY: New York University Press.
- Gilmore, S. & Anderson, V. (2016) The emotional turn in higher education: A psychoanalytic contribution. *Teaching in Higher Education. 21*(6): 686–699.
- Gross, J. J., & Thompson, R. A. (2007). Emotion Regulation: Conceptual Foundations. In J. J. Gross (Ed.), *Handbook of Emotion Regulation*. New York, NY: The Guilford Press.
- Guimarães-Costa, N. & Pina e Cunha, M. (2013). The inevitability of liminality in organizing. *International Journal of Management Concepts and Philosophy, 7*,47-63.
- Hawkins, B & Edwards, G. (2017). Facing the monsters: Embracing liminality in leadership development. In S. Kempster, A. Turner, & G. Edwards (Eds). *Field Guide to Leadership Development*. Cheltenham, UK: Edward Elgar Publishing.
- Hall, K. & Tori, K. (2017). Best practices recommendations for debriefing in simulation-based education for Australian undergraduate nursing students: An integrative review. *Clinical Simulation in Nursing, 13*(1), 39-50. <http://dx.doi.org/10.1016/j.ecns.2016.10.006>
- Hay, A. & Samra-Fredericks, D. (2016) Desperately seeking fixedness: Practitioners' account of 'becoming doctoral researchers'. *Management Learning 47*(4): 407–423.
- Hunter, S. & Mapes, P. (2013). Designing digital puppetry systems: Guidelines and best practices. In *ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)*. Extended Abstract, ACM, Paris: France, 2821-2822.
- Isenbarger, L., and Zembylas, M. (2006). The emotional labour of caring in teaching. *Teach. Educ. 22*, 120–134. doi: 10.1016/j.tate.2005.07.002

- Irving, G., Wright, A. & Hibbert, P. (2019). Threshold concept learning: Emotions and liminal space transitions. *Management Learning*, 50, 355-373.
- Johnson, B. (1992). *Polarity management: Identifying and managing unsolvable problems*. Amherst, MA: Human Resource Development Press.
- Johnson, B. (1998). *Polarity management: A summary introduction*. Middleville, MI: Polarity Management Associates. Harvard University Press.
- Kaufman, D., & Ireland, A. (2016). Enhancing teacher education with simulations. *TechTrends*, 60(3), 260-267
- Keefer, J. M. (2015) Experiencing doctoral liminality as a conceptual threshold and how supervisors can use it. *Innovations in Education and Teaching International*, 52, 17–28. doi: 10.1080/14703297.2014.981839
- Kegan, R. (1994). *In over our heads: The mental demands of modern life*. Cambridge, MA: Harvard University Press.
- Kegan, R. Lahey, L. Fleming, A. & Miller, M. (2014). Making business personal. Harvard Business Review. Retrieved from <https://hbr.org/2014/04/making-business-personal>
- Kiley, M. & Wisker, G. (2009) Threshold concepts in research education and evidence of threshold crossing. *Higher Education Research & Development*, (28), 4, 431–441. doi: 10.1080/07294360903067930
- Kiley, M. & Wisker, G. (2010) Learning to be a researcher: the concepts and crossings. In *Threshold Concepts and Transformational Learning*, Eds J. H. F. Meyer, R. Land, & Baillie. Rotterdam, Netherlands: Sense.
- Land, R., Rattray, J., & Vivian, P. (2014). Learning in liminal space: a semiotic approach to threshold concepts. *Higher Education*, 67, 199-217.
- Land, R. & Rattray, J. (2017). Threshold concepts and conceptual difficulty. *Practice and Evidence of Scholarship of Teaching and Learning in Higher Education Special Issue: Threshold Concepts and Conceptual Difficulty*, 12, 63-80.
- Lavine, M. (2014). Paradoxical leadership and the competing values framework. *The Journal of Applied Behavioral Science*, 50(2), 189-205.
- Lazarus, R. S., & Alfert, E. (1964). Short-circuiting of threat by experimentally altering cognitive appraisal. *The Journal of Abnormal and Social Psychology*, 69(2), 195.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Beverly Hills, CA: Sage Publications.
- Lindgren, R., & Johnson-Glenberg, M. (2013). Emboldened by embodiment six precepts for research on embodied learning and mixed reality. *Educational Researcher*, 42(8), 445-452.
- Luft, J., & Ingham, H. (1961). The Johari window. *Human Relations Training News*, 5(1), 6-7.
- Mackenzie, C., Rogers, W., & Dodds, S. (Eds.). (2014). *Vulnerability: New essays in ethics and feminist philosophy*. Oxford, UK: Oxford University Press.
- Mahdi, L. C., Foster, S., & Little, M. (Eds.). (1987). *Betwixt & between: Patterns of masculine*
- Mapes, D. P., Tonner, P., & Hughes, C.E. (2011). An environment for the efficient control and transmission of digital puppetry. In *International Conference on Virtual and Mixed Reality Systems and Applications*. Berlin-Heidelberg, Germany: Springer-Verlag, 270-278.
- Mayer, J., Caruso, D., & Salovey, P. (2016). The ability model of emotional intelligence: Principles and updates. *Emotion Review*, 1-11. doi: 0.1177/1754073916639667
- Mayer, J., Salovey, P., & Caruso, D. (2004). Emotional intelligence: Theory, findings, and implications. *Psychological Inquiry*, 15(3), 197-215.

- Mayer, J., Salovey, P., & Caruso, D. (2008). Emotional intelligence: New ability or eclectic traits? *American Psychologist*, 63(3), 503-517. doi: 10.1037/0003-066X.63.6.503
- Meyer, J. H., & Land, R. (2005). Threshold concepts and troublesome knowledge: Epistemological considerations and a conceptual framework for teaching and learning. *Higher Education*, 49(3), 373-388.
- Milgram, P., & Kishino, F. (1994). A taxonomy of mixed reality visual displays. *IEICE TRANSACTIONS on Information and Systems*, 77(12), 1321-1329.
- Moos, R. H., & Billing, A. G. (1982). Conceptualizing and measuring coping resources and processes. In Goldberger & S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects*. New York: Free Press.
- Mumford, M. D., & Connelly, M. S. (1991). Leaders as creators: Leader performance and problem solving in ill-defined domains. *The Leadership Quarterly*, 2(4), 289-315.
- Mursion, (2020). Administrator scenario. Mursion: San Francisco, CA.
- Nagendran, A., Pillat, R., Kavanaugh, A., Welch, G., & Hughes, C. (2013, October). AMITIES: Avatar-mediated interactive training and individualized experience system. In *Proceedings of the 19th ACM Symposium on Virtual Reality Software and Technology*. 143-152.
- Ng, W., Nicholas, H., & Williams, A. (2010) School experience influences on pre-service teachers' evolving beliefs about effective teaching, *Teaching and Teacher Education*. (26)278–289. doi: 10.1016/j.tate.2009.03.010
- O'Callaghan, K. & Piro, J. (2016). Virtual simulations in a practice based teacher education. *The Field Experience Journal*. 17(1), 94-118.
- Piro, J. (2017). Mixed reality simulation principal/parent and principal/teacher rubric and assignment. mixed reality simulation scenario for educational leadership candidates. Unpublished document. Western Connecticut State University.
- Piro, J. & O'Callaghan, C. (2019a). Journeying towards the profession: Exploring liminal learning within mixed reality simulations. *Action in Teacher Education*. (41)1, 79-95. DOI: 10.1080/01626620.2018.1534221
- Piro, J. & O'Callaghan, C. (2019b). Traveling through the liminal: Mixed reality simulations in educational leadership preparation. *International Journal of Leadership in Education*. DOI: <https://doi.org/10.1080/13603124.2019.1629488>
- Ragland, M., Asera, R., & Johnson, J. F. (1999). Urgency, responsibility, efficacy: A study of successful Texas school districts. Austin, TX: Charles A. Dana Center, University of Texas at Austin. Retrieved from <http://www.starcenter.org.products/reports.html>
- Rantatalo, O., & Lindberg, O. (2018). Liminal practice and reflection in professional education: police education and medical education. *Studies in Continuing Education*, 40(3), 351-366.
- Rattray, J. (2016). Affective dimensions of liminality. In Land, R., Meyer, J.H., & Flanagan, M.T. (Eds.), *Threshold concepts in practice* (67-76). Rotterdam: Sense Publishers.
- Reams, J. (2017). An overview of adult cognitive development research and its application in the field of leadership studies. *Behavioral Development Bulletin*. 22(2), 334-348
- Reiter-Palmon, R. (2003). Predicting leadership activities: The role of flexibility. *Individual Differences Research*, 1(2), 124.
- Ricoeur P (1991b) Narrative identity. *Philosophy Today*. 35(1) 73–81
- Saldaña, J. (2015). *The coding manual for qualitative researchers*. 2nd. Ed. Thousand Oaks, CA: Sage Publications.

- Shaffer, D.W., Dawson, S. L., Meglan, D., Cotin, S., Ferrell, M., Norbash, A., & Muller, J. (2001). Design principles for the use of simulation as an aid in interventional cardiology training. *Minimally Invasive Therapy & Allied Technologies*, 10(2), 75-82.
- Shlomo, S.B., Levy, D. & Itzhaky, H. (2012.) Development of professional identity among social work students: contributing factors, *The Clinical Supervisor*. (3)240–255. doi: 10.1080/07325223.2013.733305
- Skrla, L., Scheurich, J., & Johnson, J. F. (2000). Equity-driven, achievement-focused school districts: A report on systemic school success in four Texas school districts serving diverse student populations. Austin, TX: Charles A. Dana Center, University of Texas at Austin. Retrieved from <http://www.starcenter.org.products/reports.html>
- Soderlund, J. & Borg, E. (2017). Liminality in management and organization studies: Process, position, and place. *International Journal of Management Reviews*, 00, 1-23.
- Spiro, R.J. & Jehng, J. (1990). Cognitive flexibility and hypertext: Theory and technology for the non-linear and multidimensional traversal of complex subject matter. In D. Nix & R. Spiro (eds.), *Cognition, Education, and Multimedia*. Hillsdale, NJ: Erlbaum.
- Sauvé, L., Renaud, L., Kaufman, D., & Marquis, J. S. (2007). Distinguishing between games and simulations: A systematic review. *Journal of Educational Technology & Society*, 10(3), 247-256.
- Suedfeld, P., & Granatstein, J. L. (1995). Leader complexity in personal and professional crises: Concurrent and retrospective information processing. *Political Psychology*, 509-522.
- Tracy S. and Trethewey A. (2005) Fracturing the real-self, fake-self dichotomy: Moving toward “crystallized” organizational discourses and identities. *Communication Theory*. 15(2) 168–195.
- Thompson, B., Moss, C., Simkins, T., & Woodruff, T. (2019). Vulnerability in the classroom: A catalyst for subjective well-being, empathy, and learning. *Business Education Innovation Journal*, 11(1).
- Tucker, V. M., Weedman, J., Bruce, C. S., & Edwards, S. L. (2014). Learning portals: Analyzing threshold concept theory for LIS education. *Journal of Education for Library and Information Science*, 55(2), 150.
- Turner, V. (1969). Liminality and communitas. *The ritual process: Structure and anti-structure*, 94(113), 125-30.
- Turner, V. W. (1970). *The forest of symbols: Aspects of Ndembu ritual* (Vol. 101). Cornell University Press.
- Turner, V. (1987). Betwixt and between The liminal period in rites of passage. In Eds. . Mahdi, L. C., Foster, S., & Little, M. (Eds.). (1987). *Betwixt & between: Patterns of masculine and feminine initiation*. LaSalle, IL: Open Court Publishing.
- Van Gennep, A. V. (1908/1960). *The rites of passage*. In T Monika B. Vizedom and Gabrielle L. Caffee. Chicago, IL: University of Chicago Press.
- Waldman, D. A., & Bowen, D. E. (2016). Learning to be a paradox-savvy leader. *Academy of Management Perspectives*, 30(3), 316-327.
- Waldman, D. A., Putnam, L. L., Miron-Spektor, E., & Siegel, D. (2019). The role of paradox theory in decision making and management research. *Organizational Behavior and Human Decision Processes*, 155, 1-6.
- Yin, R. K. (2009). *Case study research: Design and methods*. Los Angeles, CA: SAGE Publications.

- Yipp, J. & Raelin, J. (2011). Threshold concepts and modalities for teaching leadership practice. *Management Learning*, 43, 333-354.
- Zaccaro, S. J. (2002). Organizational leadership and social intelligence. In *Kravis-de Roulet Leadership Conference, 9th, Apr 1999, Claremont McKenna Coll, Claremont, CA, US*. Lawrence Erlbaum Associates Publishers.