

## ASSESSING ESCAPE ROOMS AS A TEACHING STRATEGY FOR LEADERSHIP COMPETENCY DEVELOPMENT

### Abstract

This study examined escape rooms as a teaching strategy for developing four leadership competencies associated with communication. The results indicate that escape rooms are an effective teaching strategy for communication competency development in leadership education. One hundred and five participants engaged in an escape room experience followed by a discussion focused on the competencies. The findings indicated a significant positive change from pre-test to post-test in all four student leadership competencies measured, including verbal communication, listening, advocating for a point of view, and conflict negotiation. Leadership educators should consider escape rooms as a pedagogical tool for competency development and may wish to explore alternative serious games to align with their learning objectives.

### Introduction

Escape rooms involve multiple players who find clues, complete puzzles, and negotiate multiple tasks to meet a primary goal within a set time limit (Nicholson, 2015). Escape rooms are typically for entertainment purposes but more recently have been aligned with learning objectives in various disciplines in a higher education context (Clarke et al., 2017; Eukel et al., 2017; Humphrey, 2017; Vergne et al., 2019). Jenkins (2013) suggested that games may be underutilized in leadership education and asked: "are instructors avoiding them because they find them unimportant, or are they simply afraid to use them" (p. 59)? This study points to the potential importance of escape rooms as a teaching strategy in leadership education, and more specifically, for leadership competency development in communication. Additionally, the detailed information provided on developing escape rooms in this article may assuage leadership educators' fears associated

with using this pedagogical tool.

Leadership competencies are widely utilized by companies, and professional associations for targeted areas of development, and competencies are becoming more common for student leadership development on college campuses (Ashby & Mintner, 2017; Croft & Seemiller, 2017). As this expansion continues, more research is needed connecting teaching strategies with specific areas of student leadership competency development. Seemiller and Murray (2013) stated that "further research should investigate the most effective methods for developing specific competencies" (p. 44). We sought to examine escape rooms as a teaching strategy for developing student leadership competencies connected to communication. The communication competencies we examined included verbal communication, listening, advocating for a point of view, and conflict negotiation (Seemiller, 2014). The following research question guided our study: How

effective is an escape room, paired with a guided reflection, as a teaching strategy for communication competency development in leadership education?

## Literature Review

The literature review will begin with the evolution of leadership competencies leading to the development of Seemiller's (2014) student leadership competencies. After providing a philosophical foundation for games as pedagogy, the review will transition to the use of games in leadership education. The review will conclude with the use of escape rooms in higher education settings.

### Student Leadership Competencies

The foundation for student leadership competencies began with McClelland (1973), who developed the contemporary understanding of competencies while seeking a more actionable approach for measuring aptitude. "For some purposes, it may be desirable to assess competencies that are more generally useful in clusters of life outcomes, including not only occupational outcomes but social ones as well, such as leadership, interpersonal skills, etc." (McClelland, 1973, p. 9). He believed measuring criterion or skill may be a more meaningful predictor of life-outcomes or job performance than attempting to measure intelligence. Competencies gained popularity in the 1990s as organizations adapted to increasing change (Garman & Johnson, 2006). However, during this competency proliferation, a shared, consistent, and clear definition of competencies failed to emerge (Seemiller, 2016).

In the development of student leadership competencies, Seemiller and Murray (2013) sought to identify overlapping leadership competencies found in the accreditation standards across multiple academic programs in higher education. They hoped to generate a common language of leadership competencies that could be utilized

by practitioners and researchers in a collegiate context. The researchers methodically identified common leadership competencies by comparing learning outcomes from 475 academic programs across 49 accrediting organizations and identified additional leadership competencies through a review of leadership models typically utilized with college students. Seemiller (2014) identified 60 student leadership competencies framed around eight categories: learning and reasoning, self-awareness and development, interpersonal interaction, group dynamics, civic responsibility, communication, strategic planning, and personal behavior. Our study focused on competencies found in the communication category including verbal communication, listening, advocating for a point of view, and conflict negotiation (Seemiller, 2014). Finally, the overall model gained additional credibility by analyzing the psychometric properties of student leadership competencies inventory, which showed the instrument was a valid and reliable measurement of the competency constructs (Rosch & Seemiller, 2018).

For the purposes of our study, leadership competency will be defined as the "knowledge, value, ability, and behavior that lead to the outcome of effective leadership" (Seemiller & Murray, 2013, p. 35). As outlined in the above definition, the student leadership competencies comprise four dimensions: knowledge, value, ability, and behavior (Seemiller, 2014). Knowledge is considered the students' general grasp or understanding of the concepts surrounding the competency. Value refers to the students' belief in the importance of the competency, and ability is the students' capacity to engage in the competency through skill or motivation effectively. The final dimension, behavior, reflects the students' actual engagement in the competency.

## Foundation for Games as Pedagogy

Motivation is an important learning principle that impacts the fervor with which students engage in effective learning behaviors (Ambrose et al., 2010). It can be leveraged through the intentional use of games, which possess motivational factors including fantasy, embedded challenges, perceived control, score-keeping, potential for success, and collaboration (Lepper, 1988; Malone, 1981; Myers & Reigeluth, 2016). Kapp (2012) examined six meta-analysis studies conducted between 1992-2011 that assessed the effectiveness of game-based learning. Two important conclusions were that games improved learner attitudes compared to more common pedagogy, and games promoted motivation in different learning contexts.

Games are most effective when connected to well-defined outcomes (Kapp, 2012). "Serious games" are designed with such outcomes as they are purposed beyond entertainment and connect game logic with learning design (Lameras et al., 2017). Abt (1987) coined the term and stated that serious games "have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement" (p. 9). Much of the contemporary scholarship has focused on digital gaming environments, though recent explorations of analog or non-digital serious games have emerged (Clarke et al., 2017; Humphrey 2017). A desire to use serious games in a higher education context exists as a recent review of the literature identified 165 articles that included logical and empirical evidence on how instructors might connect game logic with learning strategies (Lameras et al., 2017).

## Games in Leadership Education

Evidence suggests that games may be an underutilized teaching strategy in leadership education. Jenkins (2013) found that role-play, simulations, and games were used less frequently by leadership educators when compared to other instructional strategies. However, there are some examples of games being effectively utilized as an instructional strategy specifically in leadership education (Guthrie &

Jenkins, 2018). One example included a non-digital serious game called *Star Power*, which explored ethical leadership through the bartering of chips as students earned societal status as either a square, circle, or triangle (Allen, 2008). A post-survey following the activity included 25 respondents, of which 96% believed the game was effective for teaching ethics, 100% believed it was educational, and 37.5% made decisions during gameplay they regretted.

Similarly, Gibson (2003) discussed using the prisoner's dilemma as valuable pedagogy that breaks up the monotony of lectures and provides useful material for reflection on ethical considerations in a business environment. This game featured a narrative of two student teams negotiating choices on pricing while operating gas stations on opposing corners and involved trade-offs of cooperative or non-cooperative behaviors. Observations in the classroom showed that the game highlighted moral positions taken by students and was useful for an ethical discussion as students sometimes chose behaviors that opposed their normally espoused ethical positions.

Serious games are also supported at the national level in leadership education. The Collegiate Leadership Competition (CLC) is an innovative, multi-institutional competition designed to engage students in the deliberate practice of leadership skill development (Porter, 2018). The CLC has previously included team games such as a blindfolded obstacle course, stacking 100 Pringles into a freestanding circle, and an escape room type experience (Guthrie & Jenkins, 2018). Students were evaluated on competition results as well as the process, and a feedback mechanism was included to allow students to make meaning from the experience. In an exploratory study of the competition, participants (n = 182) completed a pre and post-test assessment that measured motivation to lead, leadership self-efficacy, and specific outcomes tailored to the CLC (Porter, 2018). Results indicated a significant increase in all three measures, although it is important to note that the study was not specifically focused on games as the CLC included other elements.

## Escape Rooms in Higher Education

Escape rooms are gaining popularity as a serious game in higher education and are being employed as an instructional strategy in various academic disciplines spanning from chemistry to applied research in sport (Clarke et al., 2017; Eukel et al., 2017; Humphrey, 2017; Vergne et al., 2019). "Escape rooms are live-action team-based games where players discover clues, solve puzzles, and accomplish tasks in one or more rooms in order to accomplish a specific goal in a limited amount of time" (Nicholson, 2015, p. 1). These interactive games have exploded in growth since the first escape room appeared in Kyoto, Japan in 2007 (Hagerty, 2017). In 2014 there were approximately two dozen escape room sites in the United States, and in 2018 there were over 2,300 (Spira, 2018). A 2015 survey including 175 escape room facilities worldwide revealed that some were designed for educational purposes, with many focusing on learning outcomes including teamwork, team-building, and communication (Nicholson, 2015).

An outfit of professors at Coventry University in the United Kingdom created the escapED program to provide a framework to assist educators in developing their own escape rooms in higher education (Clarke et al., 2017). Their framework was developed through an initial pilot of an escape room in which 13 university staff members attempted to disarm a bomb across two separate rooms. The game's learning objectives centered on communication and teamwork. Through an exploratory post-assessment, all participants stated they understood the experience's educational value and expressed interest in using a similar game in their classrooms. The final framework from the escapEd program included the following steps for educators to design an escape room: gather data on participants, develop learning objectives, create a theme for the experience, consider equipment needs, and test or evaluate the experience.

The escapEd framework was later utilized for the design of an escape room experience in an undergraduate research methods course with learning objectives focused on basic research

skills (Clarke et al., 2017), and the framework was again used in an advanced applied research skills in sport course (Humphrey, 2017). After solving puzzles to provide a soccer coach with crucial last-minute information before a board meeting, the 12 student participants completed an anonymous feedback survey and engaged in a group discussion. Students believed the game enhanced leadership, communication, problem-solving, mathematical, and observational skills (Humphrey, 2017).

An escape room study at North Dakota State University was the first to utilize a pre and post-test attached to the experience in a higher education setting (Eukel et al., 2017). Students in a pharmacy laboratory skills course completed four complex puzzles aligned with learning objectives on diabetes management, and players sought to give a child with type I diabetes the correct injection. A 23-item test on diabetes treatment was used to assess the efficacy of the game. Among the 74 participants, a significant difference ( $t(72) = -18.1, p < .01$ ) was found between the 56% pre-test average given a week prior to the game and the 81% post-test average following the experience. Through a perception exit survey, students indicated the escape room was an effective method for learning new information on diabetes and that they learned from their peers.

A unique flipped learning approach was recently used with an escape room designed for medical students (Kinio et al., 2019). Prior to participation, 13 medical students were given six journal articles to read surrounding specific areas of surgery in preparation for the escape room. The post-experience survey results indicated that this approach was useful for encouraging students to engage in positive learning behaviors as 83% indicated they were motivated to study preparation materials and spent 83.5 minutes on average reading the articles. Students also believed the experience helped test their knowledge, and they garnered more interest in vascular surgery through the experience. In another recent study, chemistry students were challenged to utilize various laboratory equipment and identify an unknown compound in order to escape (Vergne et al., 2019). At

the end of the experience, a survey indicated that all 21 respondents believed the game met the intended learning objectives.

In summary of the literature review, Seemiller and Murray (2013) have systematically identified 60 student leadership competencies, and more exploration on the appropriate teaching strategy for each is warranted. Games are effective pedagogy because they provide embedded motivational factors for learners, and games are best utilized when aligned with intentional learning outcomes (Kapp, 2012; Lepper, 1988; Malone, 1981; Myers & Reigeluth, 2016). Serious games have been used with some success in leadership education, and escape room experiences have bolstered student learning in various academic disciplines in higher education (Clarke et al., 2017; Eukel et al., 2017; Humphrey, 2017; Vergne et al., 2019). The review revealed no learning assessment of an escape room in the discipline of leadership education.

## Purpose

Our study seeks to address two gaps we've identified in the literature. First, as student leadership competencies become a more prevalent framework for undergraduate leadership learning, more research is needed to understand the best approaches for developing specific competencies (Seemiller & Murray, 2013). Second, games have been identified as an underutilized teaching strategy in undergraduate leadership education (Jenkins, 2013). In an effort to address these gaps, the purpose of our study was to examine escape rooms, paired with a guided reflection, as a teaching strategy for developing specific student leadership competencies. These competencies included verbal communication, listening, advocating for a point of view, and conflict negotiation (Seemiller, 2014).

## Conceptual Frameworks

### Experiential Learning

Due to the action-oriented nature of escape rooms and the reflective debrief that follows, we employed Kolb's (1984) experiential learning theory (ELT) to guide our understanding of how this teaching strategy resulted in the transfer of experience into student learning. Guthrie and Jenkins (2018) posited that "... leadership educators should look to experiential learning theories to ground leadership learning" (p. 108), and unsurprisingly, ELT has been utilized in numerous studies involving leadership learning with undergraduates (Burbank, Odom, & Sandlin, 2015; Eich, 2008; White & Guthrie, 2016). ELT is the transfer of experience into knowledge, and Kolb's (1984) experiential learning cycle includes four modes or stages of learning that occur cyclically. Kolb (1984) described learning as a process that involves resolving conflict and tension between opposing modes found along two dimensions as the learner moves through the learning cycle. This confrontation leads to the learning of new skills, beliefs, and knowledge. The four modes in the learning cycle include:

- Concrete Experience (CE): The open involvement in a new experience without partiality.
- Reflective Observation (RO): Reflecting on experiences while bringing multiple perspectives to bear.
- Abstract Conceptualization (AC): The integration of prior observations into coherent theories.
- Active Experimentation (AE): Utilizing these developed theories in practice through problem-solving or decision making.

In our teaching strategy, students openly participated in a team activity that involved solving complex puzzles, which necessitated practicing communication (CE). A sequenced debrief opened with student observations of productive or failed communication during the game (RO) and then transitioned to a discussion of behaviors associated with effective communication (AC). Finally, students were asked to provide concrete examples of how they might practice these

communication behaviors in their current context or student leadership positions (AE). Thus, the game experience and debrief was intentionally designed to incorporate each mode of ELT.

### Communication Competencies

The escape room experience, debrief, learning objectives, and the overall study was framed around Seemiller's (2014) student leadership competency category of communication. We focused on four specific communication competencies, including verbal communication, listening, advocating for a point of view, and conflict negotiation. Verbal communication includes the unwritten delivery of information by leaders intended to inspire or inform in various contexts, whether one-on-one or in large group settings. Listening entails leaders incorporating strategies to accurately receive messages while showing care to the communicator. Advocating for a point of view refers to leaders persuasively communicating a position or belief while maintaining respect for persons. Finally, conflict negotiation describes leaders managing disagreements by controlling emotions and fostering safe environments for difficult conversations (Seemiller, 2014). We aligned the learning objectives of the escape room to these four competencies connected to the communication category.

## Methodology

### Research Design and Sampling

This quantitative study was a pre-experimental design that included a single group pre-test, intervention, and post-test (Leavy, 2017). After reviewing some potential limitations of this design, Rosch and Priest (2017), stated that "perhaps the most common strategy of assessing leadership competency development is the pre-post test, which despite some of the cautions presented earlier can still be a useful form of assessment" (p. 92). The overall design included participants completing a pre-test measuring their knowledge, values, and abilities associated with specific student leadership

competencies at a collegiate leadership conference. The specific competencies measured were verbal communication, listening, advocating for a point of view, and conflict negotiation. The intervention included participation in an escape room and a guided reflection following the experience. A post-test measuring the same competencies was administered following the experience.

A convenience sample was utilized as participants included students that attended a regional collegiate leadership conference in fall 2018 at a large institution in the southeastern United States. Students attended the conference through their involvement in campus activities on their respective campuses and through general marketing efforts designed to target students on campuses in the southeastern United States. During the conference, students were given the opportunity to play the Southern Express escape room one-time during concurrent sessions. Therefore, participants self-selected whether or not to participate in the intervention at the conference.

### The Southern Express as an Intervention and the LEADescape Framework

This section is intended to fulfill two distinct purposes. First, it provides readers with sufficient detail to fully comprehend the escape room experience as an intervention. Second, this section describes the LEADescape framework as the methodology applied to design the intervention. Through previous experience designing escape games, we created the LEADescape framework that includes seven sequential stages to guide leadership educators in developing their own escape rooms (Banter & Egan, 2018). To meet the dual purposes of this section, the following description of the framework also includes the step-by-step development of the Southern Express escape room used as an intervention in our study. Figure 1 below represents the LEADescape framework.



Figure 1. LEADescape framework. Adapted from *Escape rooms: A student-centered approach to animating leadership learning*, by J. N. Banter and J. D. Egan, 2018. Association of Leadership Educators 28th Annual Conference, p. 140.

In the first stage of the LEADescape framework, we wrote learning objectives while being mindful of taxonomy considerations and which aspect of leadership learning would take place during the game. The Southern Express was focused on leadership behavior development and included the following learning objectives:

- Students will discuss how to effectively advocate for a point of view and will value the importance of advocating for a point of view as a leader.
- Students will demonstrate effective

verbal communication and will describe the components of effective verbal communication.

- Students will practice conflict negotiation and will discriminate between poor and effective conflict negotiation.
- Students will use listening in a team scenario and will be more interested in developing listening skills as a leadership competency.

The second stage entailed developing a theme for the escape room. Here leadership educators should ask: What type of themes will connect with my target participants? After selecting a theme, a list of items that belong in the setting should be developed. We chose a 1920s train station theme and made a list of items such as train schedules, luggage, pocket watches, train maps, postcards, and clocks. In the third stage, a storyline was constructed that connects to the theme in both a convincing and logical manner. A storyline was particularly important when physically locking participants in a room is not practical, and an alternative goal must be incorporated. For instance, the Southern Express included an overarching narrative, revealed to players during gameplay, of participants traveling on a train together to a high school reunion. An evil villain and former classmate explained in a video that he had disabled the brakes on the fictitious train the participants were riding. As an alternative goal, the participants had to access the emergency brake button, which the villain also locked away. The storyline and design permitted us to include more than one escape room game in a

single physical space.

The fourth stage in the LEADescape framework was game development. This stage required determining the types of puzzles to be used that are connected to the theme, alignment of the game with learning objectives, and the development of a flow chart that demonstrates how solving the pieces of the game leads to a successful outcome. Common escape room puzzles and elements included: searching for objects, symbol substitutions, ciphers, riddles, hidden objects in an image, using a black light, assembling jigsaw puzzles, counting objects, mirrors, and abstract logic (Nicholson, 2015). These elements should incorporate the items previously listed in stage two that belong to the theme. Game elements can be sequenced, which requires a puzzle to be solved before advancing to the next puzzle or path-based, which might include multiple sequences leading to a meta-puzzle (Nicholson, 2015). Figure 2 below is a flow chart of the Southern Express escape room, which included two sequenced pathways leading to a final meta-puzzle.

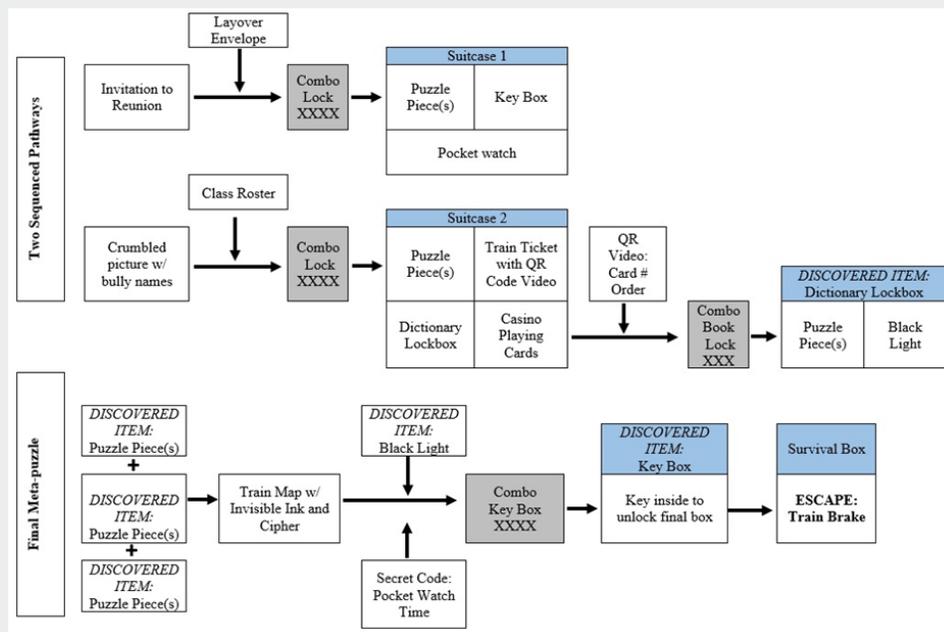


Figure 2. Flow chart displaying game sequence for the Southern Express escape room.

The game began with two locked suitcases on the train car, and only a few clues were accessible in outside pockets of the luggage. The Southern Express's final puzzle involved using the time found on a pocket watch with a cipher on a train map. The train map was assembled through jigsaw puzzle pieces found during the first two sequences, and the cipher on the map could only be revealed using a black light, which was also obtained during the first two sequenced pathways.

An essential component of our framework was the inclusion and development of a debrief discussion, the fifth stage, that connects the game to the learning objectives. This debrief allowed participants to engage in deeper learning through reflection. The Southern Express group debrief included slides with descriptions of the competencies as well as debrief questions. Below is a sample of some of the debrief questions we included.

- In what ways did you see or engage in effective verbal communication during the game? What skills do leaders need for effective verbal communication?
- Do you feel that effective listening took place during the escape room? In what ways did you specifically engage in effective listening during the escape room? What typically inhibits actively listening? How can leaders effectively engage in active listening?
- Did you ever have a strong feeling or opinion during the escape room, whether right or wrong, of the next action the group should take? How did you go about communicating this idea with the group? What skills do leaders need to advocate for their point of view?
- Were there ever moments of conflict during the escape room? Did anyone ever have opposing ideas?

In stage six, educators should pilot the game to observe how participants engage in the experience,

ensure the storyline works with the puzzles in place, gather informal feedback, and modify as necessary. We conducted two pilots of the Southern Express with easily accessible professional staff and a group of peer-mentor students on campus. These pilots led to crucial adjustments of puzzles and helped to determine an appropriate time limit for completion. The final stage of the framework calls on educators to include a formal evaluation process for participants in the escape room and to assess learning.

#### Procedures and Data Collection

At the opening conference welcome, students were given a paper copy of the informed consent as well as the pre-test questionnaire. Students were verbally informed that they could choose not to participate without consequence, and a brief description was given regarding the purpose of the study. An envelope was placed in the center of each table for students to place either a blank or completed questionnaire that included a unique identifier, which permitted pairing with post-tests while maintaining anonymity. Students created their own unique identifier based on a combination of the last four digits of their phone number and favorite color. They indicated this on the pre-test survey administered at the opening conference welcome and then again on the post-test survey administered at the end of the escape room debrief. The Likert-scale questions measuring the pre-test and post-test survey competencies were identical except for four demographic questions included on the pre-test.

The one-day conference structure included four breakout workshop periods that lasted approximately 50 minutes. Each workshop period included three unique leadership development workshops, and two rooms were designated for the Southern Express escape room. Each escape room was designed to permit four separate games to be played in the same space. During the escape room, participants played in teams of 4 to 10 individuals to collectively solve puzzles to achieve the game's goal within a 30-minute time limit. The game was followed by a 15-minute debrief connecting the experience with the student

leadership competencies of verbal communication, listening, advocating for a point of view, and conflict negotiation (Seemiller, 2014). Following the debrief, a paper copy of the anonymous post-test questionnaire was distributed, and a verbal reminder was given that participation was voluntary.

## Measure

Twelve Likert-scale items on the questionnaire were constructed based on Seemiller's communication leadership category (2014). The subscales were aligned with four leadership competencies: verbal communication, listening, advocating for a point of view, and conflict negotiation. Each subscale was connected to three items that asked participants to rate themselves on their knowledge, value, and ability with each of the competencies. For example, the conflict negotiation subscale included three items, and these items individually focused on the participant's knowledge, value, and ability associated with conflict negotiation. The measure used a four-point Likert scale with choices of strongly disagree, disagree, agree, and strongly agree. We did not allow students to be neutral on their knowledge, value, or abilities with each of the competencies. The overall construct of communication was comprised of all twelve items as a participant's aggregated response.

## Results

### Participants

Paired data were available for 105 students. Frequencies based on demographic characteristics are included in Table 1 and Table 2 below. The class year was evenly distributed for undergraduates, and graduate students were a small part (5%) of the sample as well (see Table 1). For race, the majority of students identified as White ( $n = 65$ , 62%). Thirty-four percent (34%,  $n = 35$ ) identified as another race, and 5% ( $n = 5$ ) did not specify their race (see Table 2). Unfortunately, the questionnaire overlooked capturing gender as a demographic, so the gender composition of the sample could not be reported. Sixty-four students (61%) reported participation in a

leadership program at their institution; 37 students did not (35%). Four respondents did not indicate whether they participated in a leadership program. Demographic characteristics were reported to identify the composition of the sample, and they were not analyzed in this research study.

### Scale Testing

Reliability analyses were performed on each of the subscales and the overall measures. For both the pre-test and post-test, Cronbach's alpha indicated these were reliable measures. Additionally, each of the subscales were above 0.7, except for one. This indicates that both the overall construct of communication as well as the subscales were reliable measures of the latent variable.

In addition to a reliability analysis, an exploratory factor analysis was run for both pre-test data and post-test data to examine subscales. The pre-test data revealed four factors accounting for 73% of the variance of the overall construct of communication. The post-test data also indicated four factors, and accounted for 73% of the variance. Eigenvalues greater than one indicated a factor.

### Testing Learning Gains

To test for significance between pre-test and post-test responses, we used paired samples t-tests. Each subscale was comprised of three items on a four-point Likert scale, with a maximum of 12 and a minimum of 4. The overall scale was the sum of the four subscales, with a maximum of 48 and a minimum of 16. We found significant differences in the overall construct of communication and each of the subscales: advocating for a point of view, verbal communication, conflict negotiation, and listening. Overall there was a significant change in their self-reported communication after participating in the escape room  $t(97) = -4.76$ ,  $p < .001$ . Each of the subscales indicated statistically significant increases, indicating that they all contributed to the overall change.

Table 1  
*Participants by Class Year*

	n	%
Freshmen	28	27%
Sophomore	21	20%
Junior	30	29%
Senior	17	16%
Graduate Student	5	5%

Table 2  
*Participants by Racial Identity*

	n	%
White/Caucasian	65	62%
Black/African American	27	26%
Asian	3	3%
Multiracial	3	3%
Hispanic/Latinx	2	2%
Missing	5	5%

Table 3  
*Cronbach's Alpha for Measures by Timing of Test*

Overall Construct	Pre-Test	Post-Test
Communication	.86	.85
Subscales	Pre-Test	Post-Test
Advocating for a Point of View	.74	.61
Verbal Communication	.77	.74
Conflict Negotiation	.83	.74
Listening	.82	.77

Table 4  
*Results from Paired Samples t-test*

Overall Construct	Pre-Test Mean	Post-Test Mean	Change	t	df	Sig
Communication	42.04	43.38	1.34	-4.76	97	.000
Subscales	Pre-Test Mean	Post-Test Mean	Change	t	df	Sig
Advocating for a Point of View	10.22	10.79	0.57	-5.08	98	.000
Verbal Communication	10.51	10.81	0.30	-2.40	100	.018
Conflict Negotiation	10.30	10.65	0.35	-2.45	99	.016
Listening	11.09	11.43	0.34	-3.16	100	.002

Through quantitative analysis, we demonstrated the potential to increase students' self-reported communication competencies as a result of participating in an escape room with a guided reflection. A significant, positive change was found from pre-test to post-test for all four student leadership competencies, including advocating for a point of view, verbal communication, conflict negotiation, and listening. The advocating for a point of view competency showed the greatest change after the escape room experience. The subscales each contributed to the overall change in communication.

## Discussion and Conclusion

The findings from this pre-experimental study are consistent with the research literature on serious games and escape rooms as effective teaching strategies, and we extend that conclusion to the development of communication leadership competencies. Games as tools to enhance student learning and development were found to be most effective when connected to well-defined learning objectives (Kapp, 2012). Additionally, serious games should connect the design of gaming elements to learning strategies in order to effectively apply learning to gameplay (Lameras et al., 2017). Games have also been found to be effective instructional strategies in connection to leadership learning (Allen, 2008; Gibson, 2003; Guthrie & Jenkins, 2018; Porter, 2018); however, they are an underutilized teaching strategy in leadership education (Jenkins, 2013). The use of learning objectives specifically with escape rooms has also been documented as a tool for effective classroom learning (Humphrey, 2017; Eukel et al., 2017; Vergne et al., 2019).

Students participating in the Southern Express escape room were found to have significant differences in their overall self-reported communication and demonstrated significant, positive change in the student leadership competencies of advocating for a point of view, verbal communication, conflict negotiation, and listening. Each of these student leadership competencies was connected to the game's learning objectives, and as such, these

findings are consistent with studies that found that escape rooms were effective teaching strategies when connected to learning objectives (Eukel et al., 2017; Humphrey, 2017; Vergne et al., 2019). These findings also expound on previous research that found games as effective instructional strategies to engage students in leadership learning (Allen, 2008; Gibson, 2003; Guthrie & Jenkins, 2018; Porter, 2018).

It is worth noting that most prior research focused on serious games and escape rooms that engaged students in a classroom environment. Such learning environments may have provided students opportunities to incorporate learning elements gained from previous classroom instruction as seen in Eukel et al. (2017). The Southern Express escape room, however, was implemented during a regional student leadership conference where students did not engage in any prior instruction on the student leadership competencies examined with our study. As prior instruction was unable to be incorporated into our escape room, we intentionally designed the game elements to allow students to practice each of the four communication-focused leadership competencies involved in the study. This intentional design highlights the importance of ensuring game elements connect to learning strategies and outcomes (Lameras et al., 2017).

Some limitations with our study involved the research design, data collection, and focus of the study, which each present opportunities for further examination. The pre-experimental design, as noted previously, has been described by Rosch and Priest (2017) as having limitations within the design. One concern they brought forward with assessing student leadership competencies was referenced to as the "Honeymoon Effect" (Rosch & Schwartz, 2009, p.181). This limitation refers to the bias that may occur when participants evaluate the change an intervention had immediately following their participation. Rosch and Priest (2017) point to this limitation being connected to students' inability to practice the leadership competencies beyond the intervention, which can limit the generalization of the findings. Given the context of the intervention, the sampling and timeframe of the study limited

the ability to follow up after the conference. Also, a follow-up assessment administered weeks after the intervention would have significantly reduced the response rate (Rosch & Schwartz, 2009), which would have weakened the study given the use of paired samples. Future research could include a follow-up interview with some participants to explore if the leadership competency gains were sustained and to better understand the longer-term value of an escape room experience.

Another limitation with the research design that Rosch and Priest (2017) pointed to was coined the "Horizon Effect" (Rosch & Schwartz, 2009, p.182), or more commonly referred to as response shift bias (Rohs, 2002). This concern did not prove to be an issue with the findings as the results for each of the student leadership competencies had significant, positive change between pre-test and post-test responses. Additionally, with the use of the student leadership competencies model for the selection of competencies examined in our study, Rosch and Seemiller (2018) found validity and reliability of the measurements of competency constructs through psychometric properties. Also, our analysis of the pre-test and post-test found that Cronbach's alpha indicated the measures to be reliable.

During data collection, we did not ask participants to denote their gender, which, while providing a limitation of the results, also provides an opportunity for future research involving gender and games with leadership learning. It could be interesting to explore how different demographics may impact the effectiveness of escape games or other games used for leadership learning purposes. Another limitation of the study was that the success or failure of a group of students playing the Southern Express escape room was not considered in our study. Team success or failure also provides an opportunity for future research to determine if the escape room outcome is of importance to students' responses.

We recognize that escape room development may require more planning and resources than other teaching strategies. As such, a brief description of

our experiences and resources used may benefit practitioners. Our journey into escape rooms as pedagogy began with taking our own staff to an escape room facility as a team-building exercise, and afterward, we discussed the learning that took place during the experience. From this conversation, we initially sought to provide a fun, innovative learning experience at our student leadership conference through our own escape room. A post-conference evaluation showed promising results in terms of student learning, which led to our initiation of this study, the development of the LEADescape framework, and the Southern Express escape room. We found the burden of resources was reduced as many of the materials have now been recycled into three different escape rooms used at our conferences as well as in other professional staff training opportunities on our campus. Nicholson (2015) and a few other studies exploring escape games in higher education inspired our work (Clarke et al., 2017; Eukel et al., 2017; Humphrey, 2017). We hope the LEADescape framework provides leadership educators with guidance for replicating similar learning experiences for students.

In conclusion, our study showed that escape rooms with a guided reflection could be a useful pedagogical tool in leadership education, particularly for competency development in communication. The results provide leadership educators with some empirical evidence supporting the use of escape rooms as a teaching strategy for student leadership competencies, including verbal communication, listening, advocating for a point of view, and conflict negotiation. Practitioners can also use the LEADescape framework as a methodology for developing an escape room focused on leadership learning. Future research should be conducted to examine if escape rooms can be extended to other aspects of leadership learning in different contexts. Leadership educators should consider exploring the use of games as a teaching strategy and games should no longer be, as Jenkins (2013) described, an underutilized teaching strategy in leadership education.

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