

Educational Leadership Simulations: Learning Lessons from Behind the Curtain of Educational Leadership

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Simulations have long been used for military and medical training. More recently educational simulations have evolved for training teachers and for gaming used as a tool to engage students in learning. Only recently have educational simulations been available to train school leaders who have increased demands on them to lead schools and to improve test scores. Educational leaders must be versed in a variety of managerial and instructional skills that are supremely difficult to develop in any degree or certification program. The researchers in this study used educational simulations to support graduate instruction in two different principal and superintendent preparation programs. Participants were surveyed after participating in four or more educational simulations. The study uncovered a unanimously positive perception from participants regarding their preparedness for leadership and ability to meet graduate course objectives utilizing the educational simulations. Overall, the participants reported increased confidence to handle real-life situations after engaging in the simulations, more engagement in graduate courses and a deeper perspective to think critically about issues they will be presented with in the field. Data from participants in the study provide real insights to principal preparation programs, aspiring school leaders, and districts interested in further training their current leaders.

Background

Simulations for training in the military and medical fields have been used for years. The use of games and simulations for educational purposes can be traced as far back to the use of war games in the 1600s (Smith, 2010). The purpose of these early simulations was to improve the strategic planning of military leaders. Since that time, simulations and educational games have continued to expand. The United States Pentagon used military simulations related to the Cold War crisis in the 1950s (Leemkuil, de Jong, & Ootes, 2000). In that same decade, simulations increased in popularity in both the business and medical fields (Wideman, Owston, Brown, Kushniruk, Ho, & Pitts, 2007). Thanks to the advancements in computer capabilities, the development of educational simulations has also evolved (Smith, 2010).

As the war era ended, the way in which people completed work changed. After World War II, a shift in work as something done by human force and something done by human knowledge made a change in the workforce (Smith, 2010). The first major changes were to become more precise in the work that humans were doing. The manner in which leaders lead also changed. As the industrial revolution ended leaders were forced to change to an innovative manner. Leaders were required to bring the talents of many together as a collaborative manner (Dentico, 1999). During this period, the use of calculators helped simulations become more accessible because the simulations could be conducted in shorter and shorter periods of time because the simulations did not rely on cumbersome mathematical equations (Smith, 2010). These important shifts eliminated the required manual work of calculating outcomes and laid the foundation for technology-based simulations.

Simulation Adopted as a Learning Tool for Leaders

Learning through simulations is an evolving method of developing leaders. Case studies have been used in the past to address deficits to different scenarios (Kowalski, 2013). These case studies give a single problem that can sometimes be solved in a single solution. Simulations can be used with a double loop thought, which provides leaders with a new perspective on how to handle the same simulation (Hwang & Wang, 2016). By doing the same simulation a second time, the leaders experiencing the training can see a different set of possible solutions.

There are two types of learning simulations that have been used to help train and to develop leaders. The first one is specific issue; there is a problem that is specific and need to be solved. The second type requires different roles that are defined through a variety of actions. The content type of simulation explores what action steps to take. If a decision is made, a result might happen. Process simulations look at the how and why different decisions are made. Process simulations usually occur first.

Simulations have positive effects on the development of leaders and their cognitive understanding and process. Simulations lead to a cognitive story and the story leads to the way people think and process happenings (Bruner, 1986). Old experiences are replaced with new ones as the story or simulations fills the thoughts and process of happenings in leaders.

The generic simulation model was derived from different gaming simulations and from different simulations. These generic data models were used to address a variety of people. These simulations models need to be user-configured and are difficult to do in the educational setting.

When one develops a generic simulation model many aspects are required to make the simulation work well.

Educational simulations have shown to be beneficial for economy and cost savings. Another benefit for the use of educational simulations is to mitigate risk and to enrich different experiences. These simulations allow potential leaders to make mistakes and to learn from the experience in a safe environment. These simulations also give potential leaders a wide range of simulations.

These simulations also have many features and cognitive demands that help lead trainees in an effective manner. The trainings need to meet the needs of the training purposes. The cognitive load theory is a body of knowledge that has informed instructional design in educational psychology (Sweller, 1988). The premise behind this thought is that learning while training will help leaders encode information in a way that it is remembered in the working memory. By training this working knowledge and long term memory the thought would be that as issues arise the leader will have reference points to direct their decision making in the current situations. Sweller (1994) found that working memory in complex situations is limited. The goal in instructional design is for leaders to manage the process and leaders have the cognitive load to facilitate the issue.

The Cognitive Load Theory in Regards to Simulations

The cognitive load theory (Sweller, 1994) has three different types of cognitive loads: intrinsic, extraneous, and germane. Intrinsic load is determined by the complexity of the learning content. It generally refers to the amount of information that a given situation has put toward a leader in a given situation. Extraneous load originates from mental health activities that are not directly related to the content but rather copies the design of materials that have been previously learned. Trainees are more comfortable working with simulations that are familiar as cognitive situations are easier to work with as they draw from schemata.

For training leadership to be effective and build on working memory, these simulations must have a specific structure. These structures include variables, relationships, values, distributions, and randomness. The simulations that are used are evaluated based upon the needs to trainees and the goals that facilitators are trying to get across. These structures include several variables: (a) decision and input variables, (b) mediating variables, (c) moderator and (d) outcome variables (Goosen, Jensen, & Wells, 2001). The different forms of decision variables are what set the value for trainees. These simulations also have output variables, which is the feedback that is provided to leaders based on the decision that they have made in the simulations. Dynamics in a simulation deals with the connectivity in the variables inside each different simulation. The model structure for each simulation determines the knowledge that the trainee is required to learn.

Aspects of simulations on the surface are not always as they appear and simulation in the leadership world are similar. The portion of which trainees see in a simulation contributes to the complexity of the different simulations. At the beginning stages of each simulation the variable of what inputs the trainee is going to give on the different situations. The simulation surface can range from a variety of content, which is filled with different graphical influences such as video, pictures and/or symbols. Having a surface and visual representation that is attractive and catches the attention of the audience is important. A simulation that meets the needs of specific learning objectives is equally as important.

There are many types of learning objectives that are designed through simulations. The first is insight-learning objectives; those are designed to have trainees recognize a point, principle, or relationship. The second type of learning objective found in the varied simulations is task specific procedural knowledge. These learning objectives are used in and through simulations to learn the skilled routines for different performance tasks. These simulations should be used to simulate a surgery, crisis management scenario, or trading of items. These task simulations are used in the “if that, then what” scenarios that these people may encounter (Wood, Beckmann, & Birney, 2009). These types of simulations are used repeatedly so that they become automatic responses for the trainees. The downfall to these type of simulations are that they are missing the gray area and other responses that can be necessary to resolving a problem. The third learning objective is the flexible expertise objective. In this type of learning objective the trainees are required to learn and to encompass the body of knowledge required for managing the simulated tasks, which helps the trainees transfer these knowledge into real world scenarios. The expertise knowledge-learning objective requires trainees to show flexibility to a broader scheme. The flexible simulations require multiple solutions to a complex problem that may arise throughout the day of a leader. The fourth type of learning objective used in training simulations is behavioral skills. During these simulation types, the flexible learning objectives are used with a knowledge base that includes behaviors from real world scenarios. The thinking behind the behavioral skill-learning objective is that leaders must use items they have been trained in as well as items that are built from behaviors. Putting these two aspects together effectively can lead to positive changes. The final type of learning objective is the metacognitive and deliberative processing objective. During this metacognitive and deliberative learning objective there is a high level of processes to supervise and to control lower level processes (Gourgey, 1998). This metacognition process helps hypotheses, testing, and exploration (Burns & Vollmeyer, 2002).

When using simulations as a way to train leaders one can prevent gaps that have occurred through strategies that have taken place previously in leadership training. Supporters of using these simulations have stated that the use of simulations is closely aligned to the educational goals of the facilitator. These strategies of using simulations enhance complex decision-making processes for leaders in the areas of teamwork, fostering higher level thinking, and reflection (Gary and Wood, 2011). Computer simulations enhance the process by creating a virtual reality, which challenges trainees to solve problems in a complex and dynamic manner (Berends & Romme, 1999). Simulations have proven to stimulate participant’s hidden cognitive abilities through solving problems and have offered a high level of thinking. The participants also have an opportunity to return to the start of the simulation and learn from the new ways to respond to simulations.

Simulations Changing Training Dynamics for Leaders

Simulations are changing the training dynamics for leaders because they allow for learners to work in groups or individually in order to see the reactions real time instead of the waiting for results to see if one can find something else through research to disprove the conclusion. Responses from the simulations can actually alter perceptions, actions, and thinking patterns for the trainee (Hall & Hord, 2001).

Many organizations have used simulations to enhance the thinking and problem solving of their employees. Simulations have the ability to provide participants real life scenarios and

quick time results to actions they take to solve the problem. Getting away from paper pencil tests and moving toward simulations is an intriguing way to think about educational leadership training possibilities. These simulations have the power to track the knowledge of trainees and change a method of thinking which allows leaders to be better problem solvers. Trainees are able to see the responses to different scenarios, which allows leaders to more effectively answer and solve a problem that may be similar in the future. Simulations allow for the trainee to take part in real life simulations without the real world implications. They also have the power to learn from those simulations and to develop at a much higher rate than traditional trainings.

Methods

This study consisted of both qualitative and quantitative survey data with the purpose of examining the perceptions of graduate educational leadership students utilizing simulations as an instructional tool. The study also aimed at identifying if students felt the simulations helped them meet course objectives. The study consisted of 42 graduate students at two different universities located in the Midwest United States.

Design

To evaluate the effectiveness of simulations as an instructional strategy the researchers formulated two primary research questions. Creswell (2011) advocates for “strategies for good question construction,” as it helps to create “clear language...posing questions that are applicable to all participants” (p. 385).

Careful consideration about the stakeholders and perspectives were considered in the design of the research questions. Furthermore, the usefulness of the feedback the questions presented was a consideration in the development of the research questions. These questions guided the survey instrument and provided useful data to the researchers. The research questions were:

1. What are the perceptions of graduate students enrolled in educational leadership preparation programs in regards to experiencing educational leadership simulations?
2. How do simulations help graduate students enrolled in educational leadership preparation programs meet course objectives?

Instrumentation

Online surveys were used to obtain data from participants in the study. Surveys were administered at both universities during class time so that participation was high. The surveys were sent to all participants during class. The surveys were distributed through an email, delivered to their inbox with a brief introduction letter. Students were given 20 minutes to complete the survey. The survey included both multiple choice questions as well as open-ended response questions, which allowed for reflection and open-ended responses. Creswell (2011) would advocate for a reduction in measurement error by using a good instrument with clear, unambiguous questions and response options.

Subjects

The survey population included a total of 42 graduate students at two separate universities located in the Midwest United States. These students were all enrolled in graduate educational leadership programs with principal and superintendent licensure as the outcome of the programs.

Limitations

There were two specific limitations identified in the study. The first limitation was the sample. Graduate students in two separate midwestern graduate schools were participants in the study. Perhaps graduate students in different programs and different locations would alter the outcomes of the study.

Another limitation is the actual simulation (SIM) platform used in the study. Educational Leadership SIMs was the simulation provider utilized as the instructional tool for both classes. Perhaps another technology platform would produce a different user experience with different outcomes. This is an area for future study with different platforms.

Evaluation of Data

The data in this study was analyzed using the Grounded Theory Method, which was developed by Glaser and Strauss (1965). According to Glaser (1992), the strategy of Grounded Theory is to take the interpretation of meaning in social interaction on board and study "the interrelationship between meaning in the perception of the subjects and their action" (p. 16). Therefore, through the meaning of symbols, human beings interpret their world and the actors who interact with them, while Grounded Theory translates and discovers new understandings of human beings' behaviors that are generated from the meaning of symbols. This method seemed best to analyze the perceptions of graduate students in regard to educational simulations, the ability to meet course objectives, and consequently the ability to prepare them to serve as school leaders.

As the researchers analyzed the data they began by coding the text. In the Grounded Research Theory, coding and theorizing is a key initial piece of analyzing the data. As the data was coded, key concepts began to emerge and examples were assigned to each concept. Field notes from the instructors were also analyzed to deepen and to clarify the concepts that began to emerge. Glaser (1992) suggested the use of field notes because they are an important step between coding and the final analysis where observations and insights are considered. As a final analysis, central categories were linked together from concepts that emerged from the data. Four distinct themes were formulated from the data analysis process that are each addressed in the findings of this paper.

Findings

Students were exposed to both individual and group simulations, and the instructor facilitated discussion during class time. Data from participants was synthesized into four distinct themes, which are detailed in this section of the paper. The first theme was that the discussions were highly engaging. The second theme was that the discussion stimulated critical thinking. The third

theme was that the simulations helped participants to realize different perspectives. The fourth and final theme was that participants reported an increased confidence to lead through complex scenarios.

Discussions Were Highly Engaging

Students were clear in their feedback that the discussions with their peers and instructor were the most valuable aspect of educational leadership simulations. “The most useful part of the scenarios is the conversations and thought process that goes with them,” one student said. Another commented, “The group discussions are the best part.” Students seemed to value the feedback from their peers even though it might have challenged their own thinking at times and was contrary to their own thought process. One student reported, “These (educational simulations) were very thought provoking and made for great conversations.” Another added, “I was fully engaged and also a little shocked at times. It was hard to believe that educators, parents, community members acted the way they did in some of the sims.” This was a reality check for future school leaders who could not believe that principals had to deal with difficult teachers, staff dress issues, disruptive teachers, and many other complex issues. Further data complimented other comments in this theme suggesting, “These simulations were great experiences that were actually engaging and could definitely happen to any of us individually or as an entire district.” Yet another student echoed, “I think this was a great way to learn and have discussions with my peers.”

Discussions Stimulated Critical Thinking

A second theme that emerged from the data was centered on critical thinking. Participants felt that the simulations required them think deeper about how they would actually handle situations as the school leader and forced them to negotiate the consequences of their choices. One student commented, “I loved the mental process of going through these scenarios and the situations that could arise are the benefits.” Another participant that stated, “The simulations presented a good perspective on broad topics that have many underlying pieces,” supported this. Yet another enthusiastically echoed, “The simulations were a great way to get in depth conversations started. Very thought provoking. It was great to think about what I would do in these specific situations!”

Not only did the simulations force students to think deeply and critically about the decisions required, but the simulations also helped participants identify gaps in their preparedness as school leaders. Many students commented on this idea saying, “The simulations helped me figure out where I need to spend my time preparing for the future.” Another stated, “The Ed Sims showed me that I have still have much to learn when it comes to knowing policies at the district, state, national level.” Clearly, students were challenged to think critically about the simulations at hand but also their own preparedness as a school leader. Understanding one’s gaps in learning is an important benefit from simulations highlighted by participants. Because students realized their gaps in learning they could then address strategies to learn these lacking concepts and skills. This may assist them to be a better school leader when given the opportunity to lead.

Simulations Helped to Realize Different Perspectives

Much of why students felt the simulations helped them realize different perspectives was because of the thought process or comments others shared during class discussions. One student made clear, “I liked having the discussions during the simulations. This allowed me to see the perspective of others.” Various students also commented about hearing different perspectives saying, “They (simulations) were a great way to think through things and realize different perspectives.” Another commented, “I liked this format. It gave us all a chance to chime in with our opinions and many of the simulations were eye-opening to problems we may not be involved in.” Based on the simulated experience and follow-up discussions students felt that they better realized different perspectives. One concluding thought from a student mentioned, “I look at education in a completely different light after going through these.” Leadership preparation programs need to find ways to help prospective leaders realize different perspectives as schools continue to diversify (Mette, Nieuwenhuizen, & Hvidston, 2016). For a single instructional tool to completely change the perspective of students, it is clear simulations may be an effective method of preparing future school leaders.

Increased Confidence to Lead Through Complex Scenarios

Based on feedback from participants one could say that educational simulations increased the confidence of future school leaders to handle complex scenarios they will face in the field. Comments to support this were, “I feel more confident in my preparedness to handle real-life scenarios when in the field.” Another graduate student reflected, “The sims gave me confidence in how I would respond to an issue in order to continue/establish strong inter-relationships with staff, parents, and community.” Another student added, “I enjoyed the Sims and feel much more prepared for scenarios similar to these in future positions.” Because principals are faced with complex and important issues on a routine basis, improving their confidence to handle these stressful issues is critical to their future success (Figueiredo-Brown, Ringler, & James, 2015). This is often very difficult in a traditional classroom approach. Per the feedback in this study it is clear that simulations are a key tool to improve the confidence of future school leaders and help them prepare for the complex issues they will soon face.

Simulations to Help Students Meet Course Objectives

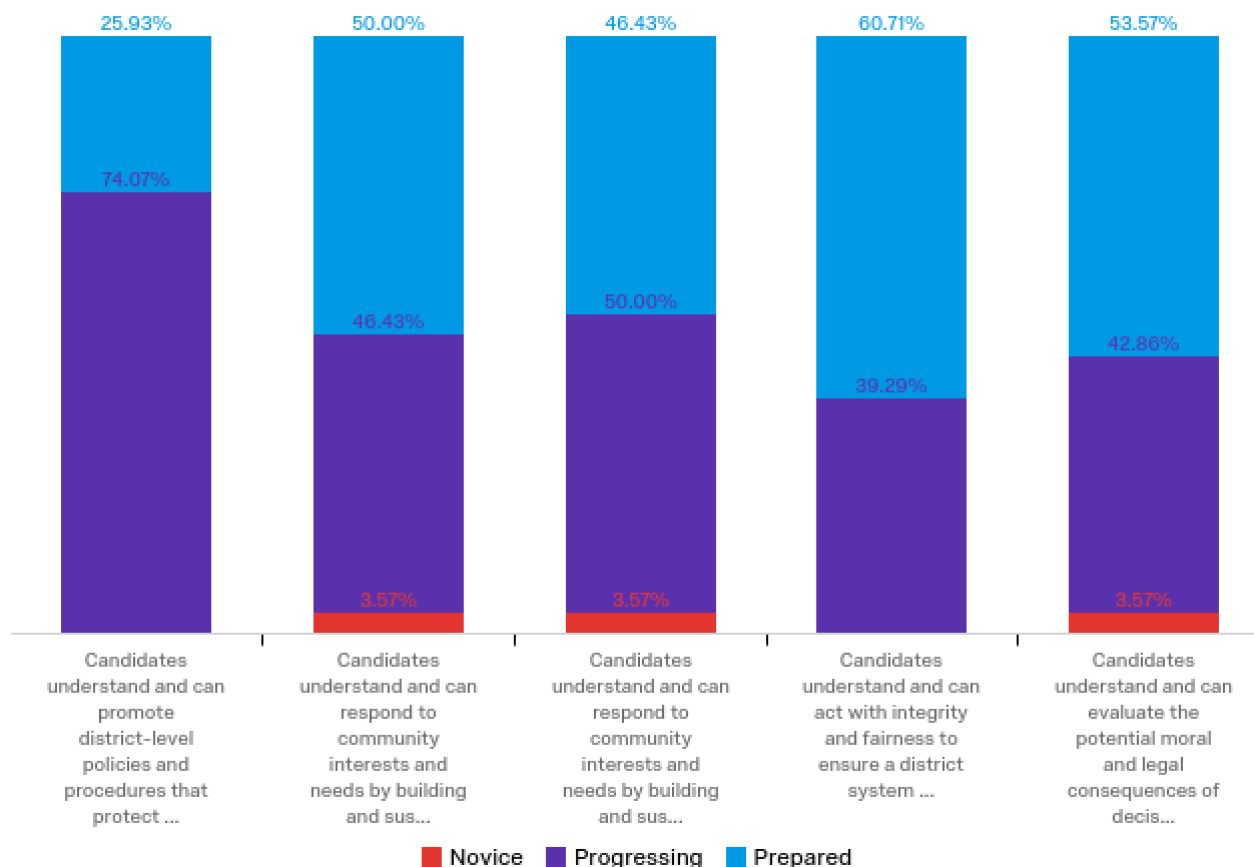
The second research question was, “How do simulations help graduate students enrolled in educational leadership preparation programs meet course objectives?” Students were asked to report on the survey how the education simulations helped them to meet the course objectives. Their feedback was reported using a standards-based approach. The options were “novice,” “progressing,” and “prepared” leader in regard to each course objective (See Chart 1).

The highest rated course objective that was most influenced by the simulations was, “Candidates understand and can act with integrity and fairness to ensure a district system to ensure a district system of accountability for every student’s academic and social success.” Over 60.71% of participants reported that they were “prepared” as a leader on this course objective in part due to the simulation experiences. No students reported being “novice” on this course objective after engaging in four or more educational leadership simulations.

The lower rated course objective as reported by the participants was, “Candidates understand and can promote district-level policies and procedures that protect the welfare and safety of students and staff across the district.” Although no students reported as “novice” for this objective, the majority of participants (74.07%) felt like they were still “progressing” on this course objective.

The other course objectives each had 3.57% of students report being “novice” in meeting the objective(s). The progressing category ranged from 42.86%-50% for each of these particular course objectives. “Candidates understand and can evaluate the potential moral and legal consequences of decision making in the district (43.86%).” “Candidates understand and can respond to community interests and needs by building and sustaining positive district relationships with families and caregivers (46.43%).” “Candidates understand and can respond to community interests and needs by building and sustain productive district relationships with community partners (50%).” As reported by the participants themselves, clearly education simulations helped students meet the course objectives, although some more than others.

Chart 1: Leader preparedness toward course objectives



Conclusions

The aim of this research study was to understand graduate students’ perceptions of simulations in preparing them for school leadership and to identify if simulations help students meet the course

objectives. After experiencing four or more Ed Leadership SIMs, 42 out of 42 graduate students in this study reported that educational simulations were effective or highly effective. Based on the data presented in this study one could clearly gather that educational simulations, whether it is the Ed Leadership SIMs platform or another delivery model, are well perceived by graduate students. One student explained, "They (simulations) provided a good training ground to try and make mistakes without real consequence." This is normally the goal of simulations.

Graduate students studying to become principals and/or superintendents are well versed in coursework and in instructional strategies. This study made clear that experiencing educational simulations and the discussions that ensued, were highly valued as an instructional method by students. Participants who engaged in the simulations reported that they valued discussions and consequently had a broader perspective because of the experience. Evidence of a broadened perspective was heard from one student who commented, "The answers are not always exactly as we would choose or say, however it is good to see how small actions have a great impact on a situation." A graduate student supported this idea when sharing, "I feel like the simulations were a valuable resources to prepare future leaders. I'm glad I had the chance to learn from them. The class was much more engaging and relevant than reading a traditional textbook." Comments like this sum up the overall data from participants and confirm that educational simulations are a worthy instructional tool to prepare future principals and superintendents.

As technology improves, so will the tools and resources available to prepare school leaders. Simulations are currently a highly effective tool that licensure programs should consider utilizing when preparing school leaders. Johnson (2016) found that recent graduates of educational leadership preparation programs reported a lack of training in budget, achievement data analysis, parental involvement, dealing with difficult parents, and human resources. Each of these items has a specific simulation that was facilitated in this study (p. 11). The comments, insights and suggestions from participants in this study convey the overall benefit of simulations and the importance of the discussions that follow. Perhaps school districts wanting to further train their principals or to ensure principals handle situations in a similar manner could benefit from educational simulations.

The data from this study clearly answered the research questions. Educational leadership simulations do help prepare school leaders by engaging them in real-life scenarios and building their confidence to handle other complex situations they will soon face in the field. The simulations build the perspectives of future school leaders, help them to critically analyze complex situations, and consequently meet course objectives. After engaging graduate students in educational simulations and analyzing the data, educational leadership simulations have the potential to help prospective leaders learn lessons from behind the curtain of educational leadership.

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