INDIANA PUBLIC SCHOOL SUPERINTENDENT SENSEMAKING OF E-LEARNING

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Chapter 1

Introduction

There is a saying in Indiana that if you do not like the weather outside, just wait five minutes, and it will change. This unpredictability complicates decisions for school district superintendents across the state during the winter months when the weather impacts if school is open for the day. School district superintendents make many critical decisions involving their district curriculum, budget, student achievement, and personnel (Nyland, 2019). Yet, very few decisions are more highly anticipated and criticized than that of whether or not to close school due to inclement weather (Noppe, Yager, Webb, & Sheng, 2013). In fact, many retired school superintendents are very grateful they no longer have to worry about making the decision to close school due to weather (Delisio, 2019).

Advances in technology have changed the ways education is delivered to students (Clarey, 2007). One major way technology has changed education is that it allows for learning to occur without the teacher and student being in the same physical location. For many districts, long gone are the days when students would look forward to a day off from school and playing outside in the snow on an unscheduled school cancellation (USC) (Morones, 2014 and Loughlin, 2018). Instead many students will now be inside their homes, on their computers, virtually working on their lessons for the day in the form of e-learning (McIntyre, 2016). In education today, many teachers create digital lesson plans for all grades K-12 that can be implemented in case of a USC. As districts turn to a 1:1 initiative in which every student has access to an electronic device, e-learning has taken on a new meaning. For this study, e-learning refers to the practice of learning digitally at home in place of attending school for the day due to a USC caused by inclement weather.

E-learning occurs when teachers digitally post assignments for students to complete at home during a USC. Districts across the state are implementing professional development around e-learning to improve teachers' understanding of the concept (Watson, 2019). District leaders have found this practice to be effective since it not only helps teachers with e-learning practices, but also improves how they implement technology in the classroom (Hua, Davison, & Kaja, 2017). Yet, there is a wide spectrum of e-learning policies that dictate what quality e-learning instruction looks like and best practices for implementing e-learning effectively and efficiently in a school district.

Background of the Study

Karl Weick's Sensemaking Theory suggests that people seek to organize and make sense of their environment. Sensemaking is prompted by a disruption to the normal flow of activity within an organization. People then act (enactment) on the disruption in an ongoing process of updating their beliefs of what is happening by observing and linking information. After people act, they use hindsight and extract cues from their environment (selection) to determine if their first action was the proper decision to make in that situation. Finally, through their perceptions and believability of how well their action fits their identity, they will either keep the act they have selected (retention) or they will find an alternative that better fits who they are (Wieck, 1995).

Technology has activated the sensemaking of school superintendents by creating equivocality within the ways that education can be taught, learned, and delivered. It is the role of the school superintendent to determine the district's technology action plan to bring continuity back to the organization (Noppe, Yager, Webb & Sheng, 2013). As technology continues to improve and advance, superintendents are caught in the ongoing process of updating their

pedagogy to integrate technology in their districts. Superintendents have addressed technological disruption in many ways. For example, they may provide professional development for teachers on how to use technology, purchase laptops or tablets for every student in the district to access technology (1:1 initiative), or they may allocate resources to provide and maintain a learning management system. As superintendents make more decisions about technology for their districts, they reflect upon their past experiences and extract cues from their stakeholders and environment for future technology selections and implementation strategies.

Another disruption that has activated superintendent sensemaking occurs when school is cancelled due to inclement weather (Roy, 2014). One selection that many Indiana district leaders have made to solve this disruption to the flow of education is the implementation of e-learning on USCs (Watson, 2019). The decision to hold and implement e-learning days is based upon the characteristics of the district and the identity of the superintendent combined with the plausibility for e-learning for district stakeholders. If stakeholders have a positive perception of e-learning, then it will be retained. Likewise, if stakeholders have a negative perception of e-learning, then the policy will be altered or eliminated.

Historically, if school was closed for the day, the district would simply add a make-up day to the end of the school calendar (Marcotte & Hemelt, 2007; McIntyre, 2016). One issue with this policy is that the instruction that occurs during make-up days at the end of the school year is often not equal to the instruction that takes place during the year in the regular scope and sequence of the curriculum (Hua, Davison, & Kaja, 2017). Another issue that arises from the make-up day tradition is that students often miss instructional time before they take state standardized tests (Marcotte & Hansen, 2010). As state and federal legislatures continue to emphasize school accountability and district letter grades, superintendents are pressured to

rethink simple school closures and find alternative ways to enhance learning when in-person instruction can't happen, especially on days before students take standardized achievement tests (Marcotte & Hemelt, 2007).

There is little disagreement that the amount of instructional time before taking standardized achievement tests has an impact on student performance on the tests (Marcotte & Hemelt, 2008; Marcotte & Hansen, 2010). In fact, many districts continue the practice of pushing their start date earlier into the summer to make sure they get more instructional days before the state tests are distributed. Most Indiana districts will start school in early August and end school by the second week of June. All districts are now faced with the pressure of school accountability that is primarily calculated by a formula based on student achievement on a standardized test. The Indiana Department of Education states that, "The overall framework of Indiana's Student-Centered Accountability System includes three domains: student performance on the state test, student growth on the state test, and multiple measures" (IDOE, 2017). The state of Indiana gives districts a three-week window to complete the standardized tests. Yet, this flexibility can be misleading as all tests, including tests for absent students, must be done by the last day of the window. Since most testing takes a minimum of three days, most districts start testing at the beginning of the window and use the remaining time to test students who were absent during the testing sessions and complete all the required forms to comply with the tests. In Indiana, the first round of the state standardized test is given in late February, and the second round occurs in the middle of April. Since most USCs happen in the months of January and February before the standardized tests are administered, e-learning provides district leaders an option to enhance learning within the current scope and sequence of their curriculum that would otherwise be disrupted due to lost instructional time before the standardized test is given.

Like Indiana, many states across the Midwest (Ohio, Kentucky, Pennsylvania, and others) have found an alternative for USCs in the form of e-learning. The Indiana Department of Education (IDOE) has created a department for e-learning to provide districts data, ideas, and resources for implementing e-learning. Additionally, e-learning days are not only used in cases of inclement weather, they can also be used as planned make-up days and for professional development of teachers and staff (Loughlin, 2018). But this new freedom came with strict guidance when e-learning was originally developed and approved by the IDOE, which required each district to submit a plan for e-learning. Once this plan was approved, the district could implement e-learning and count e-learning days as part of the required 180 days school needed to be open. The concept of e-learning has become so widely accepted in K-12 districts across the state of Indiana that districts are no longer required to submit a plan for approval. In fact, the use of e-learning days is growing so rapidly, Candice Dodson, Director of e-learning for the IDOE stated, "Currently, 278 districts or schools, including 101 nonpublic and 177 public schools are approved for using e-learning days" (IDOE, 2018).

Faced with the dilemma of a USC and having to add days to the end of the school calendar to make up for lost instructional time, many Indiana school district superintendents have turned to an e-learning day program. Yet, not all superintendents agree on the decision to select e-learning or on the ways it should be implemented. Superintendents' e-learning implementation decisions offer their districts plans that fall into one of four main categories:

1. No e-learning policy (add make-up days to the end of the school calendar)
2. Always implement an e-learning day (any USC is considered an e-learning day)
3. On some USCs, e-learning is implemented, but on others it is not (most often occurring due to consecutive USCs)

4. Scheduled e-learning days on the school calendar (banking days in case of USCs)

In summary, the superintendent's decision to implement e-learning on a USC can be complex. Due to its relatively new adoption, this decision becomes even more difficult without clear best practices for implementation or a widely accepted rationale for superintendents to use in determining if they should implement e-learning on a USC.

Problem Statement

The vast amount of discretion given to school district superintendents in the implementation of an e-learning day during a USC caused by inclement weather has put Indiana superintendent decision making in the spotlight. The advances in technology combined with the disruption to the flow of education caused by inclement weather activates the sensemaking of school superintendents. Superintendents must act, select, and retain a policy that best fits their district identity by reflecting and extracting cues from their stakeholders. They must also create a plausible story for their decision that their community can understand and relate to, especially if they need to defend the decision against criticism. For example, superintendents may base their decisions on their understanding of the situational awareness of the community in terms of technology usage, overall connectivity of the district, access to the internet, the technology capabilities of the teaching staff, as well as beliefs and attitudes of the community towards using technology in the classroom. There has been a large increase in the number of school districts implementing e-learning, but the sensemaking that is used by superintendents to make the decision to implement an e-learning day or to opt out and use traditional methods for making up lost instructional time is unclear. Additionally, there are variances in implementing an e-learning day among the districts represented by superintendents who do participate in e-learning.

Purpose

The purpose of this perceptual study of Indiana public school superintendents is to discover superintendents' sensemaking for policy decisions regarding e-learning implementation on USCs. Superintendents of e-learning districts and non-e-learning districts were surveyed to improve the understanding of the sensemaking behind their decisions to implement e-learning or continue with more traditional practices for making up lost instructional time when USCs occur due to inclement weather.

Methods and Sampling

This study is a quantitative study researching the sensemaking that Indiana public school superintendents use in their decisions to implement e-learning days for their districts when school is cancelled due to inclement weather. All 291 Indiana public school superintendents were sent an email with a link to complete the superintendent sensemaking survey regarding implementing an e-learning day on an unscheduled school closing caused by inclement weather.

Significance of the Study

Since e-learning is a relatively new concept, the significance of the study begins by filling a gap in research as there are zero studies specific to the decision-making process of Indiana school superintendents regarding implementation of e-learning days when school is cancelled due to inclement weather. Furthermore, there is scant research offered on the topic of using e-learning to replace traditional instruction during a USC, and this study provides a starting point for when districts consider implementing an e-learning day program. Consequently, research from this study will apprise school district leaders of the key sensemaking factors that influenced a superintendent's decision to implement an e-learning day to replace traditional ways of making up for lost instructional time due to a USC caused by inclement weather.

Additionally, the significance of the study impacts the quality of learning for students, the type of instruction used by educators, and ultimately the school accountability letter grade for the district. Research from this study will contribute to the understanding of a district leader's knowledge base concerning the implementation of e-learning for USCs that will improve the overall effectiveness of e-learning. Understanding the sensemaking that superintendents invoked to make their decisions on how to handle days when school is cancelled due to inclement weather will assist other superintendents when faced with similar circumstances. Furthermore, an increase in the amount of quality instructional time before statewide standardized assessments will positively impact student performance. Since student performance on standardized tests accounts for a minimum of 40% of the overall school letter grade, and school cancellations in the days leading up to these tests caused by inclement weather are a reality for most Indiana public schools, understanding and implementing an effective e-learning day program is vital for Indiana school districts to earn a desirable school accountability letter grade.

Research Questions

1. What is Indiana public school superintendents' sensemaking regarding implementing an e-learning day when faced with an unscheduled school cancellation due to inclement weather?
2. How does superintendents' sensemaking vary according to school district context?
3. How does superintendents' sensemaking vary according to their own identity?

Conceptual Framework

The study employed the use of Karl Weick's (1995) sensemaking framework to identify themes of vagueness, doubt, and indecision surrounding the topic of e-learning implementation for USCs. The connections between sensemaking and organizing are critical for this study because the interpretations about e-learning emerging from the sensemaking process will have an influence on the rationale superintendents use to make the decision to implement e-learning on

USCs for their respective school districts. Figure 1 illustrates the relationship between individual sensemaking processes and organizing activities as reconstruction occurs. Organizing activities (enactment, selection, retention) embody sensemaking processes (noticing, bracketing, identity construction, focusing on extracted cues, and plausibility) which occur retrospectively in an ongoing, reciprocal interaction with the environment (Weick, Sutcliffe, & Obstfeld, 2005).

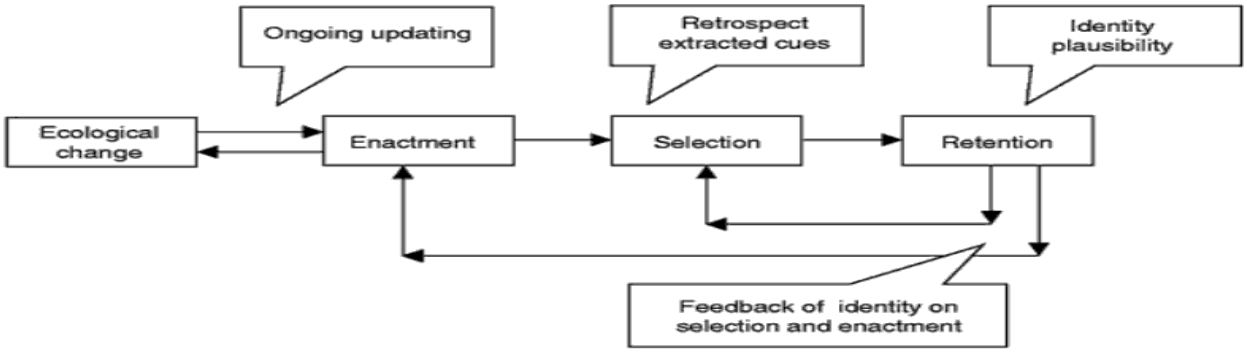

Figure 1: The relationship between individual sense-making and organizing activities
Source: From Jennings and Greenwood (2003), adapted from Weick 1979, p. 132, in Weick, Karl. E. & Sutcliffe, Kathleen, M. & Obstfeld, David. (2005). Organizing and the Process of Sense-making. *Organization Science* 16(4), 414.

Assumptions

There are many assumptions contained in Karl Weick's Sensemaking Theory that are applicable to this study. Weick's Sensemaking Theory posits that there are seven characteristics of equal value and influence on the decision-making process. For this study, five of the seven characteristics were researched (selection, retrospective, retention, social, and identity). It is assumed that the superintendent's decision making is an ongoing process and therefore the sensemaking characteristic of ongoing is omitted from this study. Also, the sensemaking characteristic enactment is assumed for this study since every Indiana public school superintendent is faced with the decision to cancel school due to inclement weather. Next, it is assumed that the process of sensemaking is independent, meaning anyone's ability to influence and impact other people's beliefs within an organization is of equal status. The final assumption

of Weick's Sensemaking Theory that is pertinent to this study is that sensemaking does not account for issues of power, knowledge, structure, and past relationships (Helms, Thurlow and Mills, 2010).

Definitions

I am providing definitions to help the reader better comprehend some common terminology involving technology in education. For the purpose of this study, it is important for the reader to be familiar with the vocabulary and understand their meanings.

1:1 Initiative—occurs in a school district when each student is provided an electronic device and access to the internet during the school day to use in the classroom.

E-learning—the practice of learning digitally at home in place of attending school for the day due to a USC.

Learning Management System (LMS)—a software that many school districts use to carry out standard tasks such as grading, attendance, and book fees, but can also be used to deliver instruction, collaborate with other students, and as a way to augment learning digitally.

Sensemaking—an ongoing accomplishment that emerges from effort to create order and make retrospective sense of what occurs (Weick, 1993: 635).

Unscheduled School Cancellation (USC)—occurs when school is closed for the day due to inclement weather.

Chapter Summary

This chapter focuses on the sensemaking Indiana superintendents use to make the decision to implement e-learning on USCs. As the use of technology in K-12 education continues to grow and access to technology increases for many students, e-learning has become a

viable option for many Indiana school districts. Like many other states that endure long winters in which inclement weather can cancel school, the Indiana Department of Education has approved the practice of e-learning on USCs caused by inclement weather, and the number of districts implementing e-learning is growing. Through the lens of sensemaking, this chapter begins examining the reasons why some Indiana Superintendents implement e-learning while others continue the more traditional practice of closing school due to inclement weather and making up the missed time by adding days to the end of the school calendar. There are many different factors that superintendents must consider, and there is no definitively-accepted justification to use in their decisions to implement e-learning.

Dissertation Organization

This study is organized into five chapters. The first chapter is the introduction that provides the basic outline for the study. The second chapter provides the literature review on the topics of sensemaking, decision making, and e-learning. The third chapter offers the methods used in this quantitative study, including the survey used to collect information from superintendents. The fourth chapter affords an examination and a discussion of the findings from the research. The fifth chapter comprises the summary, conclusions, and recommendations of the study. The study ends with references.

Chapter 2

This chapter is organized thematically on the topic of e-learning as an alternative means of delivering education to students when school is cancelled due to inclement weather. I begin the chapter with a thorough review of Karl Weick's theory of sensemaking. I uses sensemaking as an investigative lens to better understand how school district leaders decide to implement e-learning when school is unexpectedly cancelled. The review then gives a brief history of digital learning and focuses on the many different aspects and definitions of e-learning. I then examined the ever-changing and developing world of technology in education and how advances in access have opened opportunities for learning beyond the traditional classroom and forced educators to adapt their lessons to include technology. Next, the review studies advantages and disadvantages of e-learning and the best practices in implementation. The review shifts to the impact unplanned school closings have on student achievement and what school districts across the nation are doing to overcome this obstacle. The next focus of the review is a brief history of the e-learning day program in Indiana and the guidelines the state gives to school districts that are interested in implementing an e-learning day to make up for lost instructional time. The final section of the review examines the effectiveness of e-learning.

Sensemaking Theory

The foundations of Karl Weick's theory of sensemaking began in the 1970's and have had a profound impact on organizational studies. In his book *The Social Psychology of Organizing* (Weick, 1977), Weick contended that organizing occurs when people collectively take action (enactment), and the action takes place within their environment, which they reflect on to make sense of their action by making meaning out of their experiences through labeling and making connections (selection). Sense is maintained in the form of cognitive mental maps

that indicate what is crucial for carrying out their tasks and how they are interconnected (retention). Through collaboration, people link their experiences over time, and, as a result, they develop an agreed-upon standard operating procedure pertaining to how an issue should be dealt with. Hence, a group of people become organized when their mental maps unite (Weick, 1979).

In 1993 Weick wrote, "The basic idea of sensemaking is that reality is an ongoing accomplishment that emerges from efforts to create order and make retrospective sense of what occurs" (Weick, 1993, p. 635). Then in 1995 Weick argued in *Sensemaking in Organizations* that sensemaking is much more than a cognitive approach to understanding organization, saying, "People make sense of things by seeing a world on which they already imposed what they believe. People discover their own inventions, which is why sensemaking understood as invention, and interpretation understood as discovery, can be complementary ideas" (Weick, 1995 p. 15).

Additionally, in 1995 Weick described sensemaking as an ongoing process that involves seven properties that have also been elaborated on by other researchers interested in the process of sensemaking. These are discussed at length below.

Grounded in Identity Construction

The characteristics of the sensemaking characteristic identity are outlined below. The foundations and arguably the most important properties of sensemaking can be found in identity construction that begins with an individual (Mills, Thurlow & Mills, 2010). Yet, sensemaking is never simply just an individual process. Weick posited, "How can I know who I am until I see what I saw?" (Weick, 1995, p. 20) The roots of sensemaking can be found in identity construction. Our identity is constantly being transformed from the environment in which we live and from the interactions we have within our environment. The interactions we have impact

how we interpret the events of our world (Mills, Thurlow & Mills, 2010). Everyone has an identity of self, but that identity is not truly known until it is tested in an environment.

The process of sensemaking is activated when a person's perception of their identity is not confirmed by others in the environment. During this process, people will seek to find reassurances that they are who they believe to be, but if they are unable to connect their own beliefs and actions, they will configure a new sense of self to bring harmony back to their identity. People discover their identity only after displaying it in an environment and witnessing the moment (Weick, 1995). "What the (interrupted) situation means is defined by who I become while dealing with it or what and who I represent. I derive cues as to what the situation means from the self that feels most appropriate to deal with it, and much less from what is going on out there" (Weick, 1995, p. 24). We create our identities from many interactions that occur daily. As we move from one interaction to another, we are constantly redefining our identity to figure out which identity is suitable for the situation and surroundings. Our identity is constantly being transformed from the environment in which we live and from the interactions we have in our environment. The interactions we have impact how we interpret the events of our world (Mills, Thurlow & Mills, 2010). Weick also theorized, "How can I know what I am until I see what they do?" (Weick, 1995, 24) People have more than one identity and can apply any of their identities and react to the behaviors and decisions of others in a given situation. The determining factor of which identity to use in a given situation is based upon individual perception of what is going on. Furthermore, interpreting what is happening is defined by either the identity of the individual handling the situation or by the characteristics of the organization they represent. Which identity to use or characteristic to emphasize is determined by looking at the circumstances of the situation and interpreting what they mean. Determining which version of

self to be the most suitable to use in a situation is influenced more from identity than what is going on in the environment (Weick, 1995). Finally, to construct and understand identity, the first step is to make sense of the sensemaker (Mills, Thurlow & Mills, 2010).

Retrospective

It is clear from Weick's question, "How can I know who I am until I see what I saw?" (Weick, 1995, p. 20) that sensemaking involves retrospection and is impacted by a variety of factors. Actions are identified only after they are completed; therefore, we are always a little behind in making sense of our actions. Furthermore, our current circumstances and understanding of the present situation will impact how we determine the meaning to what has just happened (Weick, 1995). Sensemaking directly involves developing meaning to actions or events that have previously occurred. Additionally, what events are currently being endured will influence the meaning people give to past actions or events. Next, since meaning is being given to past events, anything that positively or negatively influences recollection will impact what sense is made of those past events. If the actor understands the action fits positively within the identity of the organization, a positive spin will be sent back through the enactment process to handle similar situations. Likewise, if the actor determines that the action fits negatively with the identity of the organization, a negative spin will be sent back through the enactment process, and a search for a different way to handle the disruption to the organization will begin (Jennings & Greenwood, 2003).

Furthermore, only after giving meaning to an action can the action that caused the meaning be determined. An action or event can only be given meaning after it has transpired (Weick, 1995). It is impossible for sensemaking to happen without an understanding of what has happened in the past. In other words, comprehending what is happening currently can only be

known based on what has occurred in the past (Walls, 2017). When people encounter situations in which several different possibilities and meanings can be derived from an action, they do not need more information. Instead they seek clarity of principles, priorities, and understanding to assist them in determining how to act (Wieck, 1995). In the sensemaking process, being retrospective is equal to applying hindsight to any situation, big or small, that a person encounters in their environment. Sensemaking involves hindsight, making presumptions about a situation or individual, is social and systemic, and includes organizing by communication (Weick, Sutcliffe & Obstfeld, 2005). Most often in the daily routines of people's lives, hindsight occurs in short bursts of actions and thought about those events that recently and quickly have transpired. Hindsight only makes history more intelligible than the present or future, yet, it does not make the past crystal clear. If the process of being retrospective accomplishes the task of bringing order, ending ambiguity, and restoring the flow of the daily routine, the process ends (Weick, 1995).

Enactive of Sensible Environments

The term sensemaking is the combination of the words sense and making. The properties of the sensemaking characteristics identity and retrospective are more focused on sense, while enacting is primarily concerned with the making of environments. Sensemaking is a combination of making sense by thinking and acting (Colville, Brown, & Pye, 2011). People create their environments by acting, and when they act, they produce limitations and possibilities (Weick, 1995). Weick explains how enactment occurs: "I create the object to be seen and inspected when I say or do something" (Weick, 1995, p. 61). Enacting also involves what Weick calls bracketing and punctuating. To aid in the understanding of the continuous flow of events, people bracket information within the flow of activities, catalog these events, and either discard

them or set them aside for further deliberation. The act of bracketing and then further investigating the information within the bracket (punctuating) is how people act in the search for an answer to be exposed (Weick, 1995). Sensemaking requires action and communication about the action; these processes are intertwined, and neither step is more important than the other. Communication brackets the action and gives it meaning, but both bracketing and punctuating are done throughout the process (Weick, Sutcliffe & Obstfeld, 2005).

Social

Sensemaking is a social process in which other people's beliefs, attitudes, values, and interpretations influence how a person makes sense of the world. Others do not necessarily need to be in attendance physically for social influences to affect sensemaking because sensemaking is never unsocial– how a person acts or interprets events individually is based upon their previous interactions with others (Weick, 1995). Social activities can occur during seemingly small water cooler conversations or through formal organizational meetings. Sensemaking can be equally affected by small interactions as it can by larger, more obtrusive policies and procedures. Additionally, it is common that these seemingly insignificant exchanges may have a larger than expected impact (Weick, Sutcliffe & Obstefeld, 2005). Research on the social process of sensemaking focuses on communication, dialog, and the exchange of ideas between people because these are the main means of social connections. In Weick's summary of the social property of sensemaking, he explains, "What I say and single out and conclude are determined by who socialized me and how I was socialized, as well as by the audience I anticipate will audit the conclusions I reach" (Weick, 1995, p. 62). Communication is an unending process that is the key to sensemaking. Communication becomes articulated when implied information becomes identified, bracketed, and labeled in such a way that it can be used to organize action (Weick,

Sutcliffe & Obstefeld, 2005). It is false to assume that sensemaking always ends when individuals agree to an understanding of an event. More often sensemaking concludes with a corresponding meaning from which a common understanding can be found. Regardless, events are comprehended similarly enough so that harmonized action can proceed (Kramer, 2016).

Ongoing

Sensemaking is a continuous process that has no discernable beginning or end. People are seemingly always busy and in the middle of doing something or completing a project. Sensemaking involves the ongoing process of people attempting to organize their lives to create order and make sense of what is occurring around them (Wieck, 1995). Weick summarizes the property of the sensemaking characteristic ongoing, "My talking is spread across time, competes for attention with other ongoing projects, and is reflected on after it is finished, which means my interests may already have changed" (Weick, 1995, p. 62).

Emotion also contributes to the ongoing facet of the sensemaking process. People are constantly acting in an environment that provides many different types of stimuli, and despite the large amount of experiences to take in, people are rarely unresponsive to things they come across. This is especially true when an experience disturbs an otherwise normal daily action or routine, which, in turn, sets the stage for emotion to influence sensemaking (Weick, 1995). A disturbance to the normal flow of activity is a clue that significant variations have occurred in the environment, and this disruption triggers sensemaking (Walls, 2017). A change in people's preconceived perception of the outcome of an event immediately invites emotion into the process. Emotion occurs from the moment a disruption occurs until it is removed, or a plan is created that causes order to be restored (Weick, 1995). The emotional impact of the ongoing sensemaking process can bring about a positive or negative influence. The harder and longer it

takes to find a solution to a disturbance, the higher the emotional level will be. For example, if the disturbance causes a stoppage in the flow of activity, then people will be upset. If the disruption causes the flow of activity to increase or a project to be completed faster, then people will be happy. Furthermore, if people find a way to work around the disruption and get back to the normal flow of activity, they will feel relieved. Finally, if people find the disruption has caused a larger organizational goal to be deemed impossible, their response will most likely induce rage, and if it prevents a smaller objective, they will feel annoyed (Weick, 1995).

Focused On and By Extracted Cues

Through the process of extracting cues from an act or phenomenon, people can make sense of almost anything. Sensemaking begins with the daily flow of organized chaos from which actors must extract cues that require attention to make sense of the confusion. Extracting cues from the organized chaos is accomplished by noticing and then bracketing the information (Weick, Sutcliffe & Obstfeld, 1995). When people experience events that have multiple interpretations, they extract cues from the environment, and how they react to those cues will be determined by how they made sense of them (Brown, Colville & Pye, 2014). Extracted cues are personal reference points that are easy to understand and relate to a given situation that allow people to predict what is going on in that situation. After an action has occurred, the actor then determines if the action has a positive or negative impact by looking back and interpreting the action through the extraction of cues to simplify the change in the organization's environment (Jennings & Greenwood, 2003). The impact and ultimately importance of an extracted cue depends on the context from which the cue was extracted in the first place and how the cue will be interpreted (Weick, 1995). Weick summarizes the sensemaking property of extracted cues, saying, "The what that I single out and embellish as the content of the thought is only a small

portion of the utterance that becomes salient because of context and personal dispositions" Weick, 1995, p. 62). It is probable that some extracted cues may be exaggerated, and others may be given more importance, but the strong belief and persistent use of these cues as points of reference is vital to sensemaking (Weick, 1995).

Driven by Plausibility Rather Than Accuracy

When people give meaning to an act or situation, they do not need to be correct in their definition. In fact, sensemaking is more concerned with plausibility than with being correct. The perceived result of an action is what a person can determine to make sense of; it does not matter if their perception is accurate (Weick, 1995). In other words, making sense does not have to make sense, and, furthermore, while accuracy is fine, it is superfluous, and due to the ongoing flow of action and interpreting events, it is most likely not tangible (Weick, 1995). Sensemaking is more concerned with ongoing actions and then the interpretation of those actions rather than if the action was a valid or correct response (Weick, Sutcliffe & Obstfeld, 2005). As Weick articulates, "I need to know enough about what I think to get on with my projects, but no more, which means sufficiency and plausibility take precedence over accuracy" (Weick, 1995, p. 64). Everyone loves a great story, and inherent for the sensemaking property of plausibility to take a strong hold about an activity is that it is accompanied by a great story (Weick, 1995). Sensemaking does not necessarily involve finding the correct answer or implementing the proper procedure. It is more accurately described as the ongoing process of creating a story that is easier for everyone to grasp and believe, especially when they are asked to defend the story (Wieck, Sutcliffe & Obstfeld, 2005). Plausibility over accuracy is at the essence of sensemaking because if people can find a solution to be plausible, action will continue. It is then that this action produces new information and data to be collected and analyzed to further solidify the

organization practices or engage in new answers that challenge the existing story (Weick, Sutcliffe & Obstfeld, 2005).

Developments in Sensemaking

Weick's work on sensemaking continues to be analyzed, refined, and critiqued, but the foundations and variables remain intact. Sensemaking is a process that people use to make decisions and act involving topics or circumstances that are out of their normal routine or beyond the scope of following standard operating procedures (Weick, Sutcliffe & Obstfeld, 2005). Sensemaking has developed into making something sensible through a constructive practice that is social, uses hindsight, is based on identity, is communicated, and occurs through the interactions of people and their environments (Sandberg & Tsoukas, 2014). Sensemaking involves thinking in such a way that interprets action that is cognitively known to be accurate, but at the same time tests new ideas and approaches that either solidify beliefs or discard them (Weick, Sutcliffe & Obstfeld, 2005). Ideas that are solidified will continue to be implemented; likewise, ideas that are discarded will be deemed outdated, and that thinking will no longer apply to the situation. Sensemaking is demarcated by occurrences that cause some facets of order to be broken up and halted until they are reasonably restored or stopped forever (Sandberg & Tsoukas, 2014). Sensemaking provides people with a way to handle doubt and uncertainty by forming easy-to-understand explanations of events so that they can act (Maitlis, 2005). Sensemaking has four main themes: it is dynamic in that it is more concerned with transience than constancy, cues ignite the process, it is social, and if focuses on action (Maitlis & Christianson, 2015). Sensemaking is defined as, "A process, prompted by violated expectations, that involves attending to and bracketing cues in the environment, creating intersubjective meaning through

cycles of interpretation and action, and thereby enacting a more ordered environment from which further cues can be drawn" (Maitlis & Christianson, 2015, p. 67).

In 2014, Jorgen Sandberg and Hardimos Tsoukas researched and found that while there are an infinite number of actions that can trigger a sensemaking event, they were able to identify five main categories that activate sensemaking: major planned events, major unplanned events, minor planned events, minor unplanned events, and hybrids of major/minor planned/unplanned events. A USC due to inclement weather and the subsequent implementation of e-learning would be categorized as a minor unplanned event. An e-learning day due to a USC qualifies because it interrupts school activities in many ways and causes different groups of people into sensemaking tasks to restore the normal learning that takes place during school (Sandberg & Tsoukas, 2014). Additionally, Sandberg and Tsoukas agreed with Weick in that sensemaking occurs through the processes of creation, interpretation, and enactment. Lastly, Sandberg and Tsoukas identified through their study of literature reviews on sensemaking that the main factors that influence sensemaking are context, language, identity, cognitive frameworks, emotion, politics, and technology (Sandberg & Tsoukas, 2014). Of all the factors above, technology has a special importance for this study on e-learning. The advancement in technology generates sensemaking by creating new ways for educators to use, communicate, and engage students with learning.

Sensemaking in Organizations

Sensemaking and organizing go hand in hand. Sensemaking and organizing have a symbiotic relationship in that organizing occurs as long as sensemaking is accomplished (Sandberg & Tsoukas, 2014). Organizing involves the ways in which people make sense of their situation by eliminating uncertainty and doubt; their worlds become more organized (Colville,

Brown & Pye, 2011). For many years, educational researchers have used sensemaking as a theoretical framework for examining organizational functioning, and sensemaking has proven to have a strong influence over the leadership of an organization (Walls, 2017). An effective image of organization becomes easier to visualize when an organization develops through sensemaking, not one in which organization goes before sensemaking or one in which sensemaking is formed by the organization (Weick, Sutcliffe & Obstfeld, 2005). Sensemaking begins when an unknown stimulus to organization causes a disruption such that it can be put into words and categorized. Next, the disruption is delineated and spoken throughout the organization. A person within an organization makes a decision based on a change within the organization's environment to handle the change. This action is done without fully knowing or understanding the action nor the impact of the action and therefore will need to be further examined and researched (Jennings & Greenwood, 2003). Eventually, through communication, sensemaking alters the conduct of the organization or provides a rationale to return to the status quo (Weick, Sutcliffe & Obstfeld, 2005).

When organizations learn or discover ideas that conflict with their existing beliefs, policies, and/or procedures, they begin the process of sensemaking. The first place they look is to find reasons as to why the new concepts do not apply to them and they can resume their normal activities. They find these explanations embedded in organizational frameworks such as physical limitations, long-established norms, outdated policies, and justification for this is how we have always done things (Weick, Sutcliffe & Obstfeld, 2005). Another facet of the relationship between organizing and sensemaking is that people organize to make sense of confusing and ambiguous concepts, interactions, and ideas, and then ratify this sense back into their world to make things more rational and logical. Once the action is simplified, the actor can

determine if the action fits with the identity of the organization and then can be reapplied in future episodes of disruption (Jennings & Greenwood, 2003). Sandberg and Tsoukas conceptualize and define sensemaking in an organization as being, "confined to specific episodes, triggered by ambiguous events, that occurs through specific processes, generates specific outcomes and is influenced by several situational factors" (Sandberg & Tsoukas, 2014, p. 26).

Enactment Theory

Enactment Theory is an easy way to understand the organizing process of sensemaking. In his early work, Weick stated, "ecological change and enactment in organizing = ongoing updating and enactment in sensemaking; selection = retrospect, extracted cues; retention = identity, plausibility; feedback from retention to subsequent enactment and selection = feedback of identity and plausibility to subsequent enactment and selection (Weick, 1979, p. 186).

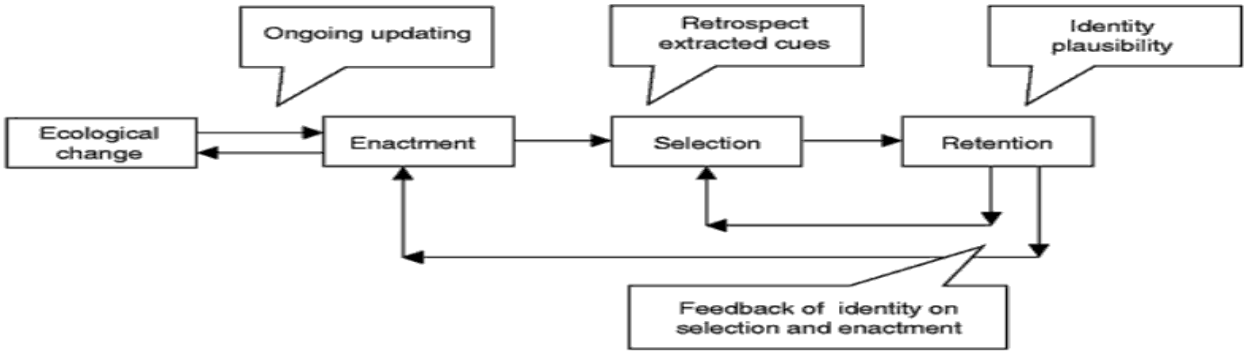

Figure 1: The relationship between individual sense-making and organizing activities Source: From Jennings and Greenwood (2003), adapted from Weick 1979, p. 132, in Weick, Karl. E. & Sutcliffe, Kathleen, M. & Obstfeld, David. (2005). Organizing and the Process of Sense-making. *Organization Science* 16(4), 414.

To begin the enactment process, a change must occur in the always ongoing environment that in turn causes a person to act on that change. The immediate reaction to the change is instantly felt in the environment and may cause another different action. Regardless of whether or not an

additional action occurs, determining if the action has a positive or negative impact requires bracketing, sorting, and reflecting on extracted cues of the event. As the information is being filtered and simplified, it becomes easier to understand and less ambiguous. To finish, the actor bases their explanation of the event on their identity, history with similar events, and the plausibility of the story (Jennings & Greenwood, 2003).

In conclusion, for this study, the ecological change is the increase in access and advancements to technology combined with the disruption in the flow of learning caused when school is cancelled due to inclement weather. The ecological change caused by an increase and advancements in technology caused an action (enactment) in school districts to purchase more technology for staff and students, provide professional development on how to use technology, and change the ways instruction is delivered and received. Furthermore, the ecological change of bad weather forces school district superintendents to make a decision (enactment) to cancel school. District leaders then examine how they feel about using technology in the classroom. Is it effective? And, most importantly for this study can it be used in place of a traditional school day during a USC (selection)? Finally, based upon their own identity and past experiences with technology, combined with the identity of their districts, stakeholders, staff, and students; school superintendents create and implement an e-learning policy they believe works best for their districts (retention).

E-Learning

Digital and technological improvements have created a world in which students learn in a variety of ways that, until recently, were never possible. Increased access to technology combined with greater and easier access to information on the internet for all people has given everyone the opportunity to learn digitally (Bonk, 2016, Lock, Eaton & Kessy, 2017). Preparing

students to be 21st century learners has forced educators to adapt their teaching methods, learn new skills, and allow for more integration of technology in their lesson plans. It is unacceptable to solely endorse and recommend current educational instructors to provide lessons in the same form and deliver them in the same way in which they received them as students (Bonk, 2016, Lock, Eaton & Kessy, 2017). Advancements in the functionality of technology in education have created endless possibilities to improve teaching and learning that go beyond the walls of a traditional classroom (Hartshorne & Ajjan, 2009). "The issue is no longer whether or not online learning is or should occur, but rather how it is implemented" (Hathaway & Norton, 2012).

Collectively these technological innovations in education combined with the process of obtaining learning digitally are often referred to as e-learning. All around the world people are creating and implementing technology in new and innovative ways to educate students, the most significant of which is e-learning (Yusuf & Al-Banawi, 2013). E-learning has caused a major disruption in how people learn and how educators teach (Cole, Shelly, & Swartz, 2014). For all educators and especially teachers, e-learning has become a reality that is impossible to ignore (Al-Banawi &Yusuf, 2013, Eaton, Kessy, & Lock 2017). E-learning has advanced in importance in educating and teaching students at all levels and encompasses more than just learning online (Gros & Garcia-Penalvo, 2016). E-learning combines learning and technology in which learning involves the process of understanding and obtaining information while technology is the main vehicle of the education process (Aparicio, Bacao, & Oliveira, 2016).

The use of distance and online education at the K-12 level is growing dramatically, but determining precisely what e-learning is and all that it incorporates has proven difficult. This is evident in that there are many different definitions of e-learning. E-learning means different things to different people, but it first became a part of common vernacular in the early 2000's

and most often referred to the delivery of an educational class or information via the web (Dublin, 2003). Nonetheless, most of the e-learning definitions found in the literature impart that e-learning denotes the use of information and communication technologies to allow the use of online learning and teaching resources (Arkorful & Abaidoo, 2015). As educational technology continues to change and improve, agreement on a single definition and terminology for everything that encompasses e-learning is becoming increasingly more difficult (Rodrigues, Amieida, Figueiredo & Lopes, 2018).

There are many questions to consider when attempting to define e-learning. For example, does e-learning only exist in the form of a student sending assignments to a professor electronically? Or does it involve the interaction between students and their educators in an online forum? Is the e-learning self-paced and personalized to fit the needs of the student, or does it come in a one-size-fits-all package? There are also many different types of e-learning, some of these include: flipped learning, distance learning, on-line learning, digital classrooms, virtual learning, and digital learning. Finding one common definition of e-learning is difficult because of the many different perceptions, beliefs, and attitudes about e-learning, and there are many different ways in which e-learning is implemented (Arkorful & Abaidoo, 2015). Despite the difficulty in finding one absolute definition for e-learning, it is clear that e-learning has come a long way from its original definition by Mary Alice White in 1983 in which she defined e-learning as, “learning via electronic source, such as television, computer, videodisk,, teletext, and videotext” (White, 1983, p. 13).

In addition to the complex ways e-learning can be defined, misconceptions about e-learning further complicate communication about this concept, such as in the relationship between e-learning and distance learning. One main misperception is that e-learning and

distance learning are the same thing. Distance learning has been available for a long time, while e-learning has only become a possibility with the advancements in technology, and, most importantly, the development of the internet (Guri-Rosenblit & Gros, 2011). Yet, it is unfair to suggest that the birth of e-learning does not begin with the concept of distance learning and that they both share the aspect of using technology to implement learning without the need for everyone to be in the same physical learning space (Gros & Garcia-Penalvo, 2016). E-learning may be thought of as the expected progression and development of distance learning, which has always involved using the latest and most advanced technological innovations for configuring education (Sangra, Vlachopoulos & Cabrera 2012). A chief misunderstanding in the conversation of e-learning is its muddling with distance education; e-learning and distance education are not the same thing (Gros & Penalvo, 2016).

Furthermore, seemingly anything that incorporates technology and education falls under the umbrella of e-learning, which only adds to the confusion as to what e-learning encompasses. "E-Learning is used widely with other terms such as online learning, technology mediated learning, web-based learning, computer-based learning, etc." (Yusuf & Al-Banawi, 2013, p. 175). Similar to distance learning, online learning is often mistakenly used synonymously with e-learning. Online learning is simply knowledge gained in part or whole over the internet (Aparicio, Bacao & Oliveira 2016). In their research, Sangra, Vlachopoulos, and Cabrera (2012) proposed four general categories for the elements of e-learning:

1) Technology-Driven—The emphasis for this category is focused on the technology of e-learning; all other characteristics of the e-learning process are of lesser importance.

2) Delivery-System-Oriented—The focus of this category is the delivery of education through technology.

3) Communication-Oriented—The attention of this element is on the exchange of information between people through technology.

4) Educational-Paradigm Oriented—This is the newest category and most often includes new technological uses in education. The main idea is the combination of one or all three of the other elements of e-learning.

In summary, a single definition for e-learning does not exist. Advancements in technology and the many different applications of technology in education have made finding one widely-accepted definition of e-learning virtually impossible. E-learning has its roots in distance education, but is constantly evolving and changing the way of instruction and learning.

Advantages and Disadvantages of E-Learning

There are many advantages to e-learning, and because of these distinct rewards, e-learning is considered one of the best approaches in education (Arkorful & Abaidoo, 2015). In their research, Valentina Arkorful and Nelly Abaidoo identified seven main advantages and benefits of e-learning:

1. Flexibility—Students can determine when and where they want to engage in the learning process.
2. Efficacy—The internet provides an easily accessible and vast arena of information for which students can access and learn from.
3. Promotes Collaboration and Communication—Using discussion forums, students who would normally not participate can do so willingly and without fear of saying something wrong in front of their peers.
4. Cost Effective—There is no need to budget for school buildings, buses, maintenance staff, etc.

5. Personalized—E-learning can be designed to fit the needs of each learner.
6. Scarcity of Resources—E-learning does not need as many teachers, instructional aides, administrators, nor other traditional school staffing needs. Additionally, other resources such as school supplies, textbooks, and copy paper are either eliminated or greatly reduced.
7. Self-Pacing—Because students can learn at their own pace, their level of stress and anxiety is greatly reduced.

Arkorful and Abaidoo (2015) also researched and identified eight disadvantages and limitations to e-learning:

1. Dependency on Motivation—For e-learning to be successful, the student must be self-motivated and hold themselves accountable for their learning.
2. Lack of Face-to-face Communication—E-learning does not provide face-to-face communication and interactions between the student and teacher for feedback.
3. Stagnant Communication Skills—E-learning does not help students develop their skills to transfer their knowledge to others.
4. Assessment Fidelity—It is very difficult to prevent cheating on e-learning assignments and assessments.
5. Piracy and Plagiarism—It is very easy to copy and paste answers. Also, due to the ease of access to information, plagiarizing is often an issue.
6. Socialization—E-learning limits the social interactions that being in the same physical place as a classroom can offer.
7. Content Inequity–Some content areas are less suited for e-learning.

8. Heavy Website Use—There is a need to teach students how to decipher information and determine what is true and accurate from what is false.

E-learning has grown and improved beyond its humble beginnings as nothing more than using a computer as a digital tool in the learning process. E-learning has progressed from traditional teacher-led video lectures to student-centered methods, in which pupils accept responsibility for their learning (Gros & Penalvo, 2016). Today, e-learning still uses the computer, but also implements teaching and learning strategies, methods, and the endless possibilities of subject matter dissemination and linkages (Aparicio, Bacao, & Oliveira, 2016). As e-learning has evolved, it has become even more difficult to define and determine precisely what it is. Based on a review of the literature, the most current and comprehensive definition of e-learning is, "an innovative web-based system based on digital technologies and other forms of educational materials whose primary goal is to provide students with a personalized, learner-centered, open, enjoyable and interactive learning environment supporting and enhancing the learning process" (Rodrigues, Almeida, Figueiredo, and Lopes, 2019, p. 95).

In summary, e-learning can no longer be considered a trend or passing fad in the world of education. The dramatic increase in the number of people who have access to the internet combined with the availability of technological devices has supported the increase in e-learning implementation.

Effectiveness of E-Learning as it Relates to Student Achievement

Determining the effectiveness of e-learning is as difficult as determining one universally accepted definition of e-learning. Many questions arise in comparing e-learning effectiveness to traditional classroom instruction. First, should e-learning replicate traditional classroom instruction? For comparison purposes, does e-learning need to look and take on the feel of the

traditional classroom? Is e-learning something entirely different than traditional classroom instruction? If it is, should the expected effectiveness outcomes be improved and of better quality? Finally, if e-learning is identified as a mode of instruction different than what occurs in the traditional classroom, should e-learning use the same measures for performance to determine effectiveness? (Nosegaard & Orngreen, 2015)

A review of literature has shown that in education the effectiveness of e-learning is most often researched in quantitative studies and measured in terms of learning outcomes (Nosegaard & Orngreen, 2015). "Learning outcomes occur when participants acquire new understanding as a result of the e-learning initiative" (Nosegaard & Orngreen, 2015, p. 281). Furthermore, learning outcomes can be directly linked to student satisfaction with their e-learning courses, which can then impact future e-learning success (Eom & Ashill, 2018). E-learning viewed through the lens of an open system has three main components that create a virtual learning environment (VLE): the student, the teacher, and the design of the course. These three aspects are in constant communication with each other to enhance e-learning and student satisfaction (Eom and Ashill, 2016).

Any discussion of the effectiveness of learning, whether it be in traditional form or obtained through e-learning, must include aspects of the individual student. The individual factors that have the greatest impact on e-learning are student experience, motivation, and practice (Nosegaard & Orngreen, 2015). Students who have more experience learning via an e-learning platform are more likely to gain knowledge than those who have never attempted to learn digitally. Additionally, a student's past e-learning experience can have a negative or positive impact on their ability to effectively learn from future e-learning classes (Nosegaard & Orngreen, 2015). It is not surprising that motivation to obtain knowledge and participate in the

learning process using technology is important to the effectiveness of e-learning. "Motivation is the most important construct for explaining online students' ability to pass exams and has a direct, positive, and significant effect on students' achievement (Eom & Ashill, 2016, p. 203). E-learning also allows the student to practice their new understandings in computer-generated simulations before applying them to real-world situations. Individualized practice provided through technology increases e-learning effectiveness (Nosegaard & Orngreen, 2015).

Another key ingredient to effective e-learning is the self-regulation ability of students (Ashill & Eom, 2018, Nguyen & Tabak, 2013). Academic self-regulation includes the ways in which students obtain knowledge and reach their academic goals (Lock, Eaton, & Kessy, 2017). Self-regulated students are identified by their regular use of learning strategies, their openness to feedback in terms of their overall learning, and by their awareness of personal academic achievements (Zimmerman, 1990). In their research, Lock, Eaton, and Kessy identified five key elements needed to promote self-regulation in e-learning: purposeful design of the online environment, goal setting, fostering self-efficacy, scaffolding, and reflection (2017). The ability for e-learning to be flexible and customizable promotes learning for students who are skilled in self-regulation (Tabak & Nguyen, 2013). Students who possess the skill of self-regulating in their learning are more likely to be successful because self-regulation of learning provides the footing of constructivism on which distance learning theory is built and is a critical learning strategy to reach the intended results of e-learning (Eom & Ashill, 2016). Additionally, research has shown that modules assigned by the teacher have a minor role in motivating students and that student motivation and self-regulation are harmonious (Eom & Ashill, 2018).

Empowering Teachers' Use of E-learning

It should not be a surprise that the teacher plays an important role in the effectiveness of e-learning. One major problem that exists is providing professional development for educators to have the skills necessary to design learning that promotes student's growth in self-regulatory skills to be successful in a VLE (Lock, Eaton & Kessy, 2017). The current situation in the world of K-12 education must acknowledge that teachers have little to zero training relating to teaching online or in a VLE (Haefner, Hartshorne & Petty, 2015). Re-teaching instructors to constantly develop their understanding and skills so that they can improve as e-learning course designers, facilitators, and motivators is vital to the success of digital learning (Eom & Ashill, 2016). Before instructors can implement technology in their lessons, they must first understand how the technology supports student self-regulation (Lock, Eaton & Kessy, 2017). Furthermore, educators must have confidence they can use the technology properly and believe in the benefits of learning virtually. If teachers do not believe they are capable of properly and successfully implementing technology in their lessons, then they will choose to not use the innovation and will opt out whenever possible (Cheok & Wong, 2015, Tabak & Nguyen 2013). Educators' attitudes, levels of anxiety, and self-efficacy towards e-learning will greatly influence the effectiveness of e-learning. Teachers need support and professional development to implement a change in their practices. Lastly, educators need a system to ensure their own satisfaction with technology in which characteristics such as flexibility, interaction, usefulness, and ease of use are considered and evaluated (Cheok & Wong, 2015).

The ability of an educator to fully comprehend their content, create a positive learning environment, manage a classroom, and differentiate instruction are important and useful traits of any effective teacher in both a traditional setting and in a VLE. But the role of the educator in a

VLE is different than the role of the traditional educator. An increase in online classes has caused an educator to be more of a facilitator than a traditional lecturer. An instructor's engagement, facilitation ability, and readiness to delivery method are extremely important to an instructor in a VLE (Martin, Parker & Ndoye, 2011). "The formal role of an e-learning instructor is to facilitate, monitor, and provide timely and helpful feedback on assessments. The informal role includes expressing a caring attitude and being responsive to student concerns, being a social supporter, exhibiting immediacy behavior and creating a learning community characterized by an atmosphere of trust and reciprocal concern" (Eom & Ashill, 2016, p. 195). A study of students' perceptions of instructors' roles in VLEs identified five of the most important roles for the e-learning educator: course designer and organizer, discussion facilitator, social supporter, technology facilitator, and assessment designer (Hung and Chou, 2015).

E-learning permits instructors and students to not be in the same physical learning environment, but student-instructor interactions and student-student interactions are critical to student satisfaction and the effectiveness of e-learning and must be considered in the design of e-learning. In one e-learning study, online students preferred courses that promoted interaction amongst the students and the teacher and included the use of multimedia (Boling, Hough, Krinsky, Saleem & Stevens, 2011). Additionally, instructor flexibility, accessibility, and providing feedback improves student satisfaction and helps build a sense of a learning community in a VLE. Instructors who provide feedback build meaningful relationships with their students that strengthen their connections. The impact of the social interactions and overall social atmosphere created in the course design of a VLE must be carefully considered by the educator. Developing and maintaining an interconnected VLE community is a vital component in the design of any successful online learning program (Boling, Hough, Krinsky, Saleem &

Stevens, 2011). The process of designing and continuously redesigning e-learning is necessary to guarantee effective e-learning. There are several foundational activities in e-learning course design: identifying learning objectives; determining and translating learning objectives module outcomes; creating assignments, projects, and assessments that are authentic, rigorous and interesting; finding and learning how to use and implement digital resources; and organizing the course in such a way that it is easy to follow and makes sense (Eom & Ashill, 2016).

In conclusion, effective e-learning is a combination of student motivation, student self-regulation, and the instructor's ability to facilitate and design a course in such a way that students feel connected to everyone in the VLE. "An e-learning system as a purposeful system is synergistic. Specifically, there exists a dynamic relationship among student motivation, self-regulatory learning strategies, instructor's facilitating roles, and students' dialog with the instructor" (Eom & Ashill, 2016, p. 61-62). The role of an e-learning instructor is ever changing and much different than that of a traditional classroom teacher. The instructor is a cornerstone of effective e-learning, and their critical roles cross several categories including facilitator, monitor, motivator, community builder, and social promoter (Eom & Ashill, 2016). Finally, an effective design of the e-learning lesson is necessary to produce successful learning results for online students.

Unscheduled School Cancellations

For many school districts, unscheduled school cancellations (USCs) are a part of any school year. They are unpredictable, but a common reality that present many challenges that most school districts will have to confront at some point in the academic year. "In a recent two-year study, more than 27 million students and 1.7 million teachers over a wide geographic area were affected by school closure events lasting at least one school day" (Wong, et al., 2014, p.

10). Most often USCs are caused by inclement weather and during the winter months (Wong, et al., 2014).

Traditionally, depending on the severity and length of the inclement weather, school districts had few options other than adding make-up days to the end of the school calendar to meet the state mandated 180-day requirement, but the introduction of e-learning has changed that. In extreme cases, some districts have found other unique ways to make up for lost instructional time due to USCs by lengthening the school day, cancelling planned holidays and having school instead, and some have even resorted to holding school on Saturdays (Chen, 2019). Today, many districts across the nation have permitted e-learning days to make up for lost instructional time due to inclement weather. In Ohio, one way for students to make up lost instructional hours is by accessing and completing assignments posted on the district's website (Ohio Department of Education, 2019). In Illinois, Public Act 101-0012 was passed that allows school districts to implement e-learning on USCs (Illinois Department of Education, 2019). In 2014, Kentucky piloted a Non-Traditional Instruction Program to encourage the continuation of academic instruction on days when school would otherwise be cancelled (Kentucky Department of Education, 2019). "From 2011-2019, over 1500 instructional days have been saved for Kentucky school districts, including a record 510 instructional days during the 2017-2018 school year and 399 days during the 20180-2019 school year" (Kentucky Department of Education, 2019). Additionally, Pennsylvania followed suit by passing legislation, Act 64, Section 1506, allowing for a Flexible Instructional Day Program, in which public schools could use alternate approaches for delivering instruction during USCs (Pennsylvania Department of Education, 2019).

In summary, USCs from inclement weather cause a disruption to the normal flow of learning. Many states, especially those that are most affected by inclement weather, are using technology in the form of e-learning to make up for the loss of instructional time.

Unscheduled School Cancellations and School Accountability

USCs also pose a major challenge for school districts in relation to their school accountability systems. The more instructional time that is lost before taking the state standardized tests will negatively impact student achievement. Triton Middle School principal Bobby Thompson noted, "The main thing that we noticed last year is that those days we had to miss due to weather were really important to us. Those were the crucial time to prepare students for standardized assessments" (Guerra, 2014, p. 1). Marcotte and Hansen (2010) found that, "An additional ten days of instruction results in an increase in student math assessments of just under 0.2 standard deviations. Which, in turn, means that the percentage of students passing math assessments falls by about one-third to one half a percentage point for each day school is closed." Furthermore, Marcotte and Hansen (2010) claimed that many fewer schools would have met their adequate yearly progress in math and reading had they not been closed on account of USCs due to weather. In 2007, Marcotte completed a study in which he focused on the impact that snowfall had on student achievement in the state of Maryland. He found that the amount of snowfall was significantly related to student performance on the state's standardized test (Marcotte, 2007). Additionally, he found that students in lower grades were more affected and that scores on the mathematics portion of the exam were most impacted by snowfall (Marcotte, 2007). Knowing their data may cause school district leaders in low or underperforming districts to keep school open during inclement weather compared to districts that have high achievement on state tests (Marcotte & Hemelt, 2008). Also, "The pass rate for third-grade math and reading

assessments will fall by more than one-half percent for each school day lost to an unscheduled school closure. This means that in years of ten or more USCs more than five percent fewer students will pass third-grade reading and math tests than in winters with no unscheduled closures" (Marcotte & Hemelt, 2008, p. 335).

In summary, faced with the proposition of closing school and risking low test scores, it is not surprising that many school district leaders have turned to e-learning as an alternative for making up lost instructional time due to inclement weather.

E-Learning in Indiana

The Indiana Department of Education requires school districts to comply with many different rules, policies, and regulations, but expectations are not as stringent for e-learning. Current state requirements not related to e-learning range from standards for what is to be taught in grades K-12, to restrictions on dietary food that can be served in the cafeteria, and protocols for the school building in terms of air quality, lighting, accessibility, and even the size of the hallways. Therefore, with all the laws and regulations that schools are forced to comply with, one would expect the regulations for e-learning to be the same, but instead the state has taken a more laissez-faire approach to e-learning.

Indiana law requires that all school districts must be open for 180 days. "Each school shall conduct at least 180 student instructional days (IC 20-30-2-3)." The advancements in technology in education and the ability for students to learn digitally from home when school is closed opened the door for school districts to incorporate e-learning days and have them count towards the mandated 180 days of school. The Indiana Department of Education (IDOE) has created a department for e-learning to provide districts data, ideas, and resources, but little in the area of regulation. The IDOE has created an e-learning Day Program Criteria document for

districts to consider when implementing an e-learning day. The IDOE (2019) lists nine areas for districts to contemplate before executing an e-learning day: internet access, instructor access, platform experience, learning targets, work continuity, accommodation support, offline support, individual needs, and work measurement.

When e-learning was originally developed and approved by the IDOE, a district had to submit an e-learning plan to the state before they could implement an e-learning day. Once this plan was approved, the district could implement e-learning and count e-learning days as part of the required 180 days school needs to be open (IDOE, 2019). But the concept of e-learning has become so widely accepted in K-12 districts across the state of Indiana that districts are no longer required to submit a plan for approval. "Effective spring 2019, Indiana schools/districts are not required to request approval from the IDOE to implement e-learning days. Assurances to maintain instructional fidelity remain the responsibility of the individual school/district" (IDOE, 2019). Additionally, more and more districts are turning to e-learning as a viable option when school is closed due to weather and more recently to provide professional development for their teaching staff. Candice Dodson, director of e-learning with the Indiana Department of Education stated that (IDOE, 2019) "Currently, 278 school districts or schools — including 101 nonpublic schools and 177 public — are approved for using eLearning days."

The Indiana Department of Education released a frequently asked question report on e-learning in February of 2019. The report serves as a guide for school districts to use in their decision to implement e-learning. Examples from the report (included below) show that the state leaves the implementation of e-learning up to the school districts.

How many eLearning Days can be used in a year?
Once approved for the eLearning Day Program, it is up to individual school districts to determine how many days they can effectively deliver instruction via eLearning, including how many

consecutive days. As with any program, communication with all stakeholders during planning and prior to the days is essential for success.

How many eLearning Days can be used in a row?
As an approved eLearning district, the number of eLearning Days used consecutively is up to the district. Discussions with school districts implementing eLearning Days seems to indicate anything over 3 consecutively is a challenge.

How is attendance determined on an eLearning Day?
That is up to the individual school or district. Most schools determine attendance by completion of assignments. Students who do not complete assignments during the designated window would be marked absent.

How are eLearning Days reported to the state?
You will report them as you do all of the instructional days on the DOE calendar, but there should be an option for eLearning Day for the type of day.

Does a district have to be 1:1 to use eLearning Days?
It is not required that an entire school or district be 1:1 in order to utilize eLearning Days. What is required is that you confirm that all students have access to a device at home, whether that is a 1:1 device, a school-owned device that is loaned to a student on an eLearning Day, or a device at home which they can use for school work. Districts that do not use a blended digital model of learning as their day-to-day instructional model should NOT be implementing eLearning Days.

Do all students have to have internet access at home in order to use eLearning Days?
If some students do not have internet access at home, they may be able to work at another location or work may be downloaded to their device before they leave school. On planned days, schools may open a building for students to access the digital resources, or community partners, ie: libraries, community centers can be utilized.

Do all schools in a district have to use eLearning days? For example, could the high school and junior highs in a district do eLearning Days but not the elementaries?
You can do eLearning Days district-wide or only at specific schools in your district.

Does all the student work have to be done online on an eLearning Day?
Just like a typical school day, all work does not need to be done online on an eLearning Day. eLearning Day should embrace a blended model of instruction, utilizing digital resources that a teacher and student are comfortable using.

How many days do students have to complete eLearning Day assignments?
That is up to the school or district, but we usually suggest giving students a few days after the eLearning Day to submit assignments in case students experience power or internet outages, illness, or complications with assignments. However, note that districts cannot “double dip.” Students cannot use a “regular” day to complete eLearning assignments.

Can we use an eLearning Day later in the school year to make up for an inclement weather day?
Yes, an eLearning Day can be used as a make-up day for an inclement weather day.

In summary, most of the decisions on how to implement e-learning in a school district are left up to each individual school district. While there are some guidelines and suggestions as to best practices, discretion on implementation is left up to the district's superintendent and school board. There are zero requirements that educators receive training in e-learning instruction, but school districts should provide professional development to guarantee that a high level of instruction exists for their students who obtain their lessons through technology (Swetlik, Graves, Hua & Davison, 2015). The Indiana school districts that have implemented e-learning agree that they are a better alternative to make up days caused by inclement weather (Hua, Davison & Kaja, 2017).

The Effectiveness of an E-Learning Day Program

The simple fact is that there is not enough research to know if e-learning is an effective alternative for making up lost instructional time due to USCs. Despite all the advancements, there is a lack of literature and research into the effectiveness of using technology in the classroom (Barbour & Reeves, 2009). In one study conducted by Swetlik, Graves, Hua, and Dvaison, they reported, "school districts had not had the opportunity to collect and analyze data to determine the effectiveness of their virtual learning plans or the impact of the virtual learning days on student learning outcomes" (Swetlik, Graves, Hua, & Davison, 2015, p. 25). There are many steps that educators may take to ensure the quality of the e-learning assignments are appropriate, but there are too many variables to determine if the lessons are effective. We do know that the best practices in e-learning do not include busy work, but instead are planned, meaningful, engaging learning experiences that are personalized and differentiated (Milman, 2014).

The biggest advantage of implementing e-learning is that the lessons stay within the regular scope and sequence of the curriculum. Gurnee School District 56 Superintendent Dr. Colleen Pacatte stated about her school district, “The academics and assignments focus on what students are working on at the time of the e-learning day” (Illinois Department of Education, 2019). Leyden High school District 212 Superintendent Dr. Nick Polyak similarly stated, “We have a philosophy that an e-learning day should move the curriculum forward. For us, that means that it should be connected to what was most recently taught and what is upcoming” (Illinois Department of Education, 2019). Indiana policy implies that e-learning lessons should provide the same level of instruction and content as if school had been open (Swetlik, Graves, Hua, and Davison, 2015). Also, it seems apparent that instruction provided via e-learning is more meaningful than instruction that occurs on make-up days that are added on at the end of the year. “By the time you start adding days to the end of the school year, kids are checked out, families are checked out, and everybody knows that they’re jumping through hoops. An e-learning day is more meaningful than adding days at the end of the school year" (Illinois Department of Education, 2019).

A 2014 study found that school closures have little impact on student achievement (Goodman, 2014). Goodman further proposed that not all instructional time is created equal and that student absences when all other students are in school is far more detrimental than when all students are gone due to a USC (Goodman, 2014). Yet, this study did not compare achievement for students who received their instruction digitally on days they were absent versus students who simply stayed home from school.

A 2017 study by Hua, Davison, and Kaja on the perceptions and attitudes of stakeholders in districts that have implemented e-learning days on USCs caused by inclement weather produced seven key findings:

1. All stakeholders liked not having to make up days in response to traditional school cancellations due to inclement weather.
2. Increased proficiency with learning technologies has encouraged teachers to be more creative.
3. Students are engaged with the virtual learning resources.
4. Students like the flexibility and autonomy that virtual learning days provide.
5. Student self-discipline is enhanced based on the high degree of participation and work completion.
6. The primary concern of parents was that they were going to have to assume the role of teacher on virtual learning days.
7. The most commonly cited challenge to implementing virtual learning days was student Internet access from home.

"The major finding of the study is that virtual learning days serve as an option school districts can implement that may avoid the negative impact school cancellations can have on student learning outcomes" (Hua, Davison & Kaja, 2017, p. 32).

In conclusion, for many students, advances in technology have revolutionized the way in which they can obtain an education. A major way that technology has changed education is that it allows for learning to occur without the teacher and student being in the same physical location. One role of a school district superintendent is to determine the best ways to incorporate technology in their districts. Superintendents' implementation of technology (in the form of e-

learning) is now helping school districts make up for lost instructional time in the event of a USC due to inclement weather.

A superintendent's decision to plan and implement e-learning during a USC can be analyzed according to Karl Weick's Sensemaking Theory. As a reminder, Weick's Sensemaking Theory suggests that people seek to organize and make sense of their environment when they are prompted by a disruption to the normal flow of activity within an organization. Inclement weather causes a disruption that triggers superintendent sensemaking. Sensemaking Theory posits that after a disruption, people then act (enactment) on the disruption in an ongoing process of updating their beliefs of what is happening by observing and linking information. Superintendents act by declaring that school is either open, on a delay, or closed due to the inclement weather. The next step in the sensemaking process occurs after people act; they use hindsight and extract cues from their environment (selection) to determine if their first action was the proper decision to make in that situation. Many Indiana school superintendents select to implement an e-learning day when school is cancelled due to inclement weather. The final step in the sensemaking process ensues when people, through their perceptions and believability of how well their action fits their identity, either keep the act they have selected (retention) or find an alternative that better fits who they are. School superintendents must determine if e-learning is an effective and plausible way for their districts to make up for lost instructional time due to a USC.

Large gaps in literature exist as to the effectiveness of implementing an e-learning day on a USC due to inclement weather. Yet, despite the lack of data and information, the number of school superintendents deciding to implement e-learning day programs in their districts to make up for lost instructional time on USCs caused by inclement weather continues to increase.

Therefore, this study, through the framework of sensemaking, fills the gap in literature by providing educators a better understanding of the sensemaking superintendents use to make the decision to implement an e-learning day when school is cancelled due to inclement weather.

Chapter 3 Research Methods

In this chapter I describe the methods used to respond to my research questions. The number of Indiana public school districts implementing an e-learning day when USCs occur has increased, but there are wide discrepancies in the sensemaking superintendents use in declaring an e-learning day. Some school superintendents choose to opt out of e-learning days and make up for lost instructional time by adding days on to the end of the year. Other school superintendents decide to always implement e-learning when school is cancelled due to inclement weather. Furthermore, some school superintendents will elect to implement e-learning days on certain occasions and decline e-learning days during other situations. Finally, some districts adjust their academic calendars to include e-learning days in lieu of USCs.

Therefore, through the framework of sensemaking, this study provides educators a better understanding of the sensemaking superintendents use to make the decision to implement an e-learning day when school is cancelled due to inclement weather.

Purpose Statement

The purpose of this quantitative study of Indiana school superintendents is to discover superintendents' sensemaking for making policy decisions regarding implementing e-learning on USCs. Superintendents of e-learning districts and non-e-learning districts were surveyed to improve the understanding of the sensemaking behind their decision to implement e-learning or continue with more traditional practices to make up for lost instructional time that is caused by USCs that occur due to inclement weather.

Research Questions

1. What is Indiana public school superintendents' sensemaking regarding implementing an e-learning day when faced with an unscheduled school cancellation due to inclement weather?

2. How does Indiana school superintendents' sensemaking vary according to school district context?

3. How does Indiana school superintendents' sensemaking vary according to their own identity?

Research Design

This study draws upon quantitative methods. I created a survey that was sent to every school superintendent (291) in the state of Indiana. Creswell states, "a survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population" (Creswell & Creswell, 2018, p. 156).

Population, Sample, and Sampling Procedures

The population for the survey was all 291 public school district superintendents in the state of Indiana. All Indiana public school superintendents were sent an email with a link to complete the superintendent sensemaking survey regarding implementing an e-learning day on an unscheduled school closing caused by inclement weather.

Instrumentation

I designed the type of questions on the survey based on Karl Weick's Theory of Sensemaking (See Appendix A). Weick's Sensemaking Theory has seven main characteristics: Identity, Retrospective, Enactive of sensible environments (Enactment), Social, Ongoing, Focused on and by extracted cues (Selection), and Driven by plausibility rather than accuracy (Retention) (Weick, 1995). All of these characteristics (with the exception of ongoing and enactment) were found in the survey and were investigated. The ongoing characteristic of sensemaking was omitted from the survey because it was assumed that sensemaking is an ongoing activity for all superintendents. The enactment characteristic of sensemaking was

omitted from the survey because it was assumed that all Indiana superintendents go through the enactment process of determining to cancel school due to inclement weather.

The survey consisted of 38 questions based on five of the seven components of sensemaking. The survey took approximately eight minutes for superintendents to complete (mean=8.09 minutes), and included multiple choice, likert scale, rankings, and open ended questions. The survey began with questions regarding the identity of the superintendent and the characteristics of the school districts that the superintendents represent. The survey then focused on selection questions regarding technology and using technology during a USC replaced with an e-learning day. The next portion of the survey was based on the retrospective nature of sensemaking, followed by the social aspect of sensemaking. The survey then covered the sensemaking categories that superintendents go through when determining the selection and retention of implementing an e-learning policy. The survey concluded with open-ended questions regarding other reasons that superintendents may have considered e-learning that were not mentioned, complications and challenges of implementing e-learning, and any benefits that have occurred as a result of implementing e-learning.

Figure 2: Sensemaking Survey

Sensemaking Component	Superintendent Survey Questions
Identity of the Superintendent	#1-8
Identity of the Public-School District	#9-18
Selection	#19-23, 33-35
Retrospective	#24-28
Social	#29-32
Retention	#36-38

Data Collection Procedures

The superintendent sensemaking survey was inserted into Qualtrics, and I used the system to collect the data for the study. I sent an email to every Indiana public school district superintendent (291), that contained a link with the survey. The survey was open for two months, and I sent a reminder every other week asking superintendents to please complete the survey. The survey was sent in early March 2020, just after the peak season for when school is closed due to inclement weather, so the topic of e-learning is still pertinent and fresh in the minds of Indiana superintendents.

Data Analysis

The analysis for this study consisted of examining bivariate relationships between variables both graphically (descriptives) and numerically (frequencies). The research questions investigated the descriptives and frequencies of Indiana school superintendents in relation to their sensemaking. Weick's Sensemaking Theory has seven main characteristics: Identity, Retrospective, Enactive of sensible environments (Enactment), Social, Ongoing, Focused on and by extracted cues (Selection), and Driven by plausibility rather than accuracy (Retention) (Weick, 1995). All of these characteristics were investigated except for Enactment and Ongoing, which are assumed for this study.

Methods for analyzing the data included different types of tests to determine if the relationship between the variables was not due to chance but rather if the relationships were significant. For the variables, a statistical test of significance was used to evaluate the relationship and to know if the relationship is significant. The type of test performed depended upon the type of variables and the number of categories within each variable.

A T-test was used to find evidence that a relationship may exist between a continuous variable and a discrete variable. A T-test is a mathematical ratio in which the differences

between the means of a variable from two different samples (the numerator) are compared in terms of standard deviation (SD) and sample sizes of the two samples (the denominator). The t-value is then compared to a distribution of t-values to determine its significance level. An Independent Sample T-test was used when the discrete variable only had two categories. For example, within the enactment category, there are two options to the question "Is your school corporation 1:1 for grades k-12:" Yes or No. ANOVA is a type of T-test that was used when the discrete variable had more than two values. For example, in the Identity category of the survey, the question regarding the highest degree obtained had four different options for the response.

A correlation test was used when determining the relationship between two continuous variables. I looked specifically at three aspects of correlation: one aspect was directionality (either positive or negative), another was magnitude (the size or strength of the relationship), and the final was significance (likelihood it is or is not due to chance). A positive correlation simply means that as one variable goes up, so does the other. The same can also be true if one variable goes down– so does the other variable. The magnitude of the relationship is determined by a range from 0 to 1. The closer the magnitude is to 1, the stronger the relationship. The significance determines if the relationship between the variables is not due to chance. For our purpose, any relationship that is .05 or less is statistically significant. In other words, we are 95% sure that the relationship was not due to chance. Finally, a Chi Square test combined with a cross tabulation was used to determine the relationship between two discrete variables.

Validating the Findings

To ensure the reliability of the survey data, I implemented the test, re-test method. I had five superintendents take the test one day and then respond again on a different day to determine if they gave the same responses. To ensure the validity of the data, I had experts in the field of

quantitative studies review the study to examine if the data from the survey was the data that answered my research questions.

Limitations

The study was limited to the number of Indiana school superintendents who responded to the survey. The study was also limited in that I did not know if the Indiana public school district's superintendent was the person responding to the survey. Also, the study is limited in that it was a quantitative study, and all that I can detect are relationships with the data. I would need to hold interviews of Indiana school superintendents in order to obtain in-depth descriptions of superintendents' sensemaking regarding e-learning; this study can only provide a landscape for understanding.

Chapter Summary

The main method of research for this quantitative study was a survey designed around Karl Weick's Sensemaking framework that was sent by email to all Indiana public school superintendents. Results from the survey were exported from Qualtrics to SPSS for analysis. Both descriptive and frequency data were analyzed, and the types of variables investigated determined the tests used to establish if a statistically significant relationship existed.

Chapter 4

This study was focused on the sensemaking that Indiana public school superintendents engaged in when they were faced with the decision of how to handle unscheduled school closings caused by inclement weather. The chapter begins by first reporting on the sample that participated in the study. The chapter is then organized in terms of the three specific research questions posed in Chapter 1, starting with describing the data for research question number one: What is superintendents' sensemaking regarding implementing an e-learning day when faced with USCs due to inclement weather? Then, the chapter reports on research question number two: How does superintendents' sensemaking vary according to school district context? The chapter concludes by examining research question number three: How does superintendents' sensemaking vary according to their own identities?

The sample for this study was 130 Indiana public school superintendents who responded to a survey that was sent to all 291 public school superintendents in the state of Indiana (response rate 44.68%). All of the participants of the study were active Indiana public school superintendents, and 81.5% of the participants were male, and 18.5% were female. At the time of the study, 20.6% of Indiana public school superintendents were female, and the national average of female superintendents was 7%. The ages of the participants in the study range from 36 to 79 years old and have a mean age of 52.6 years old with a SD of 8.1; nationally superintendents had a mean age of 54.5 years old. Most (54.6%) superintendents in the study had earned a doctorate, and at the time of the study the national average of superintendents to have a doctoral degree was 60%. The participants in the study had a wide range of experience in education and 1,093 combined years of experience (mean=8.54 years) as school district superintendents.

The superintendents who participated in the study represented school districts that had a total enrollment ranging from 500 to 22,377 with a mean of 3621.5 and a SD of 4050.68. Also, superintendents identified their school districts as being from rural areas (61.1%), suburban areas (17.6%), urban areas (15.3%), and towns (5.3%). Next, superintendents in the study represented districts from Northern Indiana (41.5%), Central Indiana (41.5%) and Southern Indiana (17.1%). Superintendents responded that 72.3% of their school districts were 1:1 in terms of technology devices for all grade levels. Of the 23.8% of districts that were not 1:1 in technology, only two schools did not have current plans to achieve 1:1 devices for all of their students, while the remaining schools planned to obtain 1:1 status by the 9th grade. Furthermore, most school districts in the survey said they would reach 1:1 status by the 5th grade with a mean average of grade 5.0 with a SD of 2.47. Additionally, 70.8% of school districts in the study implemented e-learning days when school was cancelled due to inclement weather.

Now that the sample for the study has been described, the chapter will now focus on reporting the results for research question one.

RQ 1: What is Indiana public school superintendents' sensemaking regarding implementing an e-learning day when faced with an unscheduled school cancellation due to inclement weather?

The framework for this study is based on Karl Weick's idea of sensemaking, which includes seven characteristics: enactment (assumed for this study), retrospective, social, selection, retention, identity, and ongoing (assumed for this study). Superintendents' sensemaking regarding e-learning begins when inclement weather disrupts the normal flow of the school day and forces them to make a decision to cancel school (enactment). If they decide to cancel school for the day, they then must decide to either implement an e-learning day (selection) based upon their past experiences with e-learning days (retrospective), or add days to the end of the year to make up for lost instructional time. Ultimately, they will decide to either

keep, change, or eliminate their e-learning policy (retention) to prepare for the next time inclement weather forces school to be canceled based on their personal and district characteristics (identity). The entire process and future decisions are impacted by the ongoing feedback and input they receive from their constituents, peers, and stakeholders (social). Since the sensemaking characteristics of enactment and ongoing are assumed for this study and the research for sensemaking characteristic identity is the focus of research questions two and three; the sensemaking characteristics of selection, retrospection, retention, and social will be described to attempt to understand the sensemaking process of Indiana public school superintendents regarding e-learning.

Sensemaking Characteristic Selection

In this study, the sensemaking characteristic selection occurred after a superintendent made the decision to cancel school and either selected to implement an e-learning day or add a make-up day to the end of the school year to meet the 180 school day requirement set forth by the Indiana Department of Education. Table 1 illustrates that 70.8% of survey participants responded that their school districts selected e-learning when school was cancelled due to inclement weather.

Table 1 (Sensemaking Characteristic Selection)

The extent to which Indiana Public School Superintendents implemented e-learning

Does your school district implement e-learning when school is cancelled due to inclement weather?

	Frequency	Percent
Yes	92	70.8
No	32	24.6
Total	124	95.4
Missing System	6	4.6
Total	130	100.00

Indiana public school districts began selecting to implement e-learning days when school was cancelled due to inclement weather in the 2013-14 school year, but the majority (56.6%) of school districts represented in the study started using e-learning days after the 2015-16 school year. Also, the majority of school districts (44.2%) in this survey that selected to implement e-learning days when school was cancelled due to inclement weather used between two to four e-learning days per year. The mean number of days school districts implemented e-learning days was 3.47 days per year with a SD of 2.04.

Yet, many differences remain in how each school district implemented e-learning days, and many others have continued to opt out of e-learning when school was cancelled due to inclement weather. The study found that 23.3% of participating school districts implemented e-learning whenever school was cancelled due to inclement weather, but 41.1% of school districts implemented e-learning only on some days when school was cancelled due to poor weather.

Furthermore, some districts selected to implement e-learning days for reasons other than USCs. For this study, of the 92 schools in the survey that selected to implement e-learning when school was cancelled due to inclement weather, 44.6% of them also implemented e-learning days for other reasons. The mean number of days school districts implemented e-learning days for reasons other than USCs was 2.16 days per year with a SD of 1.55.

Table 2 (Sensemaking Characteristic Selection)

Indiana public school districts e-learning policies

Please check one answer that best describes your e-learning policy?

	N	%
My district schedules e-learning in the school calendar to bank days that will be used in case school is cancelled due to inclement weather, but otherwise does not implement e-learning when school is cancelled due to inclement weather.	2	1.6%
My district schedules e-learning in the school calendar to bank days that will be used in case school is cancelled due to inclement weather and will also hold e-learning days if all the banked days are used up.	6	4.7%
My district does NOT implement e-learning when school is cancelled due to inclement weather.	26	20.2%
My district implements e-learning whenever school is cancelled due to inclement weather	30	23.3%
My district implements e-learning on some days that school is cancelled due to inclement weather (For example, not on consecutive days or more than three days in a row).	53	41.1%
Missing System	12	9.3%
Total	129	100.0%

Table 2 reports that most survey respondents (41.1%) said they implemented e-learning days on some days that school was cancelled due to inclement weather, but not every day. The next most common response (23.3%) was that the school district implemented e-learning whenever school was cancelled due to inclement weather.

Table 3 (Sensemaking Characteristic Selection)

The stakeholder factors that Indiana public school superintendents considered regarding e-learning

Survey respondents ranked the factors that they considered before making the decision to implement e-learning in their school district.

Factor	Mean Rank
Ability of the staff to provide quality instruction with e-learning	2.02
Access to the internet for students to complete their e-learning	2.44
Technology capabilities of the teaching staff	3.33
Overall connectivity (internet speed) for students in the district	3.45
Community Stakeholder concerns in terms of technology usage for learning	4.51
Students taking home their devices (keeping them from being damaged or lost)	5.24

Table 3 shows that the number one concern that survey respondents had before making the decision to select e-learning in their school district was the ability of their teaching staff to provide quality instruction via e-learning. The table also shows that the second most important factor that impacted their decision to select e-learning in their school district was access to the internet for students to complete their e-learning.

Table 4 (Sensemaking Characteristic Selection)

The general factors that Indiana public school superintendents considered regarding e-learning

Survey respondents ranked the factors they considered most important before making the decision to implement e-learning in their school district.

Factor	Mean Rank
Instructional pedagogy (remaining in scope and sequence of lessons)	2.23
Preferable to adding make-up days to the end of the school calendar	2.48
Safety	2.65
Economics (cost savings to the district and/or loss of wages for classified staff)	4.24
Pressure from other educational peers	4.39
Pressure from district stakeholders	5.01

Table 4 demonstrates that the highest ranked factor that survey respondents considered before making the decision to implement e-learning in their district was keeping instructional pedagogy within the scope and sequence of lessons. The next most important factor was the safety of their students, followed by their belief that e-learning days are preferable to adding make up days to the end of the school calendar.

Sensemaking Characteristic Retrospective

In this study, the sensemaking characteristic retrospective occurred when superintendents extracted cues from their environment and used hindsight to determine if they made the correct selection regarding their decision to implement an e-learning day after they determined to cancel school due to inclement weather. Table 5 points out that 65.4% of survey respondents either somewhat agreed or strongly agreed that e-learning days are a better alternative than adding days to the end of the school calendar to make up for lost instructional time.

Table 5 (Sensemaking Characteristic Retrospective)

The extent to which Indiana superintendents believe that e-learning is a better option than make-up days

In your opinion, e-learning days are a better alternative than adding make-up days to the end of the school calendar day to make up for lost instructional time.

	N	%
Strongly disagree	20	15.4%
Somewhat disagree	12	9.2%
Neither agree nor disagree	6	4.6%
Somewhat agree	27	20.0%
Strongly agree	59	45.4%
Missing System	7	5.4%
Total	129	100.0%

Table 6 shows that superintendents in the survey who represent school districts that have selected to implement e-learning days during USCs believed that their students, parents, teachers, and school board members have responded positively to the decision to implement e-learning.

Table 6 (Sensemaking Characteristic Retrospective)

From the perspective of the superintendent, the extent to which stakeholders approve of e-learning

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
Students in your district have responded positively to the use of e-learning?	2.2%	3.3%	4.4%	54.9%	35.2%
Parents in your district have responded positively to the use of e-learning?	2.2%	4.4%	9.9%	61.5%	78.0%
Teachers in your district have responded positively to the use of e-learning?	2.2%	3..3%	4.4%	45.6%	44.4%
School board members in your district have responded positively to the use of e-learning?	1.1%	5.5%	5.5%	42.9%	45.1%

There is a significant statistical difference between superintendents who implemented e-learning and those who did not in their opinions regarding e-learning days being a better alternative than adding make-up days to the end of the school calendar to make up for lost instructional time (χ=48.086, $p < .01$). Also, 68.8% of superintendents who did not implement e-learning disagreed that e-learning was a better alternative than adding make-up days, while 74.6% of superintendents who did implement e-learning agreed that it was a better alternative than adding make-up days. Furthermore, superintendents of districts that implemented e-learning believed that students (mean=4.18, SD=.83), parents (mean=3.97, SD=.83), teachers (mean=4.27, SD=.87) and school board members (mean=4.25, SD .87), have responded positively to the use of e-learning in their districts.

Sensemaking Characteristic Retention

In this study, the sensemaking characteristic retention occurred after the enactment and selection process and concerned the decision the superintendent must make regarding future situations in handling USCs. Weick posits that retention is based on the identity of the person (the focus of research question #3) or the characteristics of the organization that the person represents (the focus of research question #2) and the plausibility of the decision to the constituents.

The data show that 79.7% of participating superintendents approved of e-learning and that 82.2% were either looking to improve on their existing e-learning policy or were content with their current selection to implement e-learning during a USC. Furthermore, 87.5% of superintendents who have selected to implement e-learning days are satisfied with their school districts e-learning policy, and 93.1% approve of e-learning and their districts' implementation of e-learning days.

There is a statistically significant difference in superintendents who approved of and selected e-learning in their districts and superintendents who did not implement e-learning in their districts (χ=79.607, $p < .01$). Also, 93.1% of superintendents who approve of e-learning have implemented it in their district, and 41.94% of superintendents who did not approve of e-learning did not implement it in their district. There is a statistically significant difference in superintendents who implemented e-learning in their district and their decision to continue or change their existing e-learning policies (χ=75.564, $p < .01$). Also, 57.5% of superintendents from districts that implemented e-learning were planning on continuing their current policy with no changes, and 42.5% were looking to change their current e-learning policy only if it could be approved. Next, 41.9% of superintendents from districts that did not implement e-learning were at least considering it in the future; likewise, only 25.8% of these superintendents were not planning on implementing e-learning in the future.

Sensemaking Characteristic Social

In this study, the sensemaking characteristic social occurred throughout the ongoing USC e-learning decision-making process of the superintendents as they constantly updated information after interacting and obtaining feedback from peers, constituents, and experts.

Table 7 (Sensemaking Characteristic Social)

The extent to which Indiana public school superintendents believe that their social interactions impacted their decision to implement e-learning in their districts.

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
Most of the area school corporations around my district implement e-learning when school is closed due to inclement weather?	5.8%	5.8%	8.3%	39.7%	40.5%
The decision of other area school corporations around my district to implement e-learning impacts my decision to implement e-learning in my district?	30.6%	14.9%	17.4%	27.3%	9.9%
I regularly discussed the pros and cons of e-learning with other superintendents before making the decision to implement e-learning in my district?	9.1%	7.4%	24.8%	33.9%	24.8%
The discussion of the pros and cons of e-learning with other superintendents impacted my decision to implement e-learning in my district?	19.0%	7.4%	33.9%	26.4%	13.2%

The study showed that 80.0% of superintendents who implemented e-learning and 80.7% of superintendents who did not implement e-learning answered that most of the area school districts around their districts implemented e-learning when school was closed due to inclement weather (mean=4.03, SD=1.12). Yet, there is no significant statistical difference that the decision of other area corporations around their districts impacted their decision to implement an e-learning day. Additionally, 59.4% of superintendents from districts that did not implement e-

learning and 40.5% of superintendents from districts that did implement e-learning disagreed that the decisions of other area districts influenced their decision regarding e-learning (mean=2.71, SD 1.41). Both groups of superintendents (59% yes to e-learning, 46.9% no to e-learning) reported that they regularly discussed the pros and cons of e-learning with other superintendents before they made their decision to implement e-learning in their district (mean=3.58, SD=1.2). Yet, there was no statistical significance that their discussions impacted their decisions to implement e-learning. Although, 74.1 % of superintendents from districts that implemented e-learning and 72.0% of superintendents from districts that did not implement e-learning did not disagree that these discussions of the pros and cons with other superintendents impacted their decision for their districts (mean=3.07, SD=1.28).

The next focus of this chapter moves to describing the data regarding research question two. The data present the characteristics of the public school system as an organization and if superintendents' sensemaking varies according to those characteristics.

RQ#2: How does superintendents' sensemaking vary according to school district context?

For this study, the context of a school district was determined by the total enrollment of the school district, geographic location in Indiana (Northern, Central, and Southern), the type of setting the district represents (urban, suburban, rural and town), and if the school district was 1:1 in terms of technology for grades K-12.

The mean enrollment of school districts identified as urban was 6780.36 with a median of 5221.5. The mean enrollment of school districts identified as suburban was 7759.91 with a median of 7466.00. The mean enrollment of school districts identified as town 2052.25 with a median of 1639. The mean enrollment of school districts identified as rural was 1906.06 with a median of 1328.00. There is a statistically significant difference in schools that implemented e-

learning based on the total enrollment of the school ($T(42.39) = -2.61$, $p < .01$). The mean enrollment for districts that participated in the study and implemented e-learning is 2,994.59 students with a SD of 3,502.99. The mean enrollment for districts that participated in the study and did not implement e-learning is 5,478.06 students with a SD of 4,958.40.

Also, the study found that one school district identified as suburban and implemented e-learning had a much larger enrollment (22,377) than other school districts in the study. By removing this district from the study an independent samples T-Test showed that there is a statistically significant difference in schools that implemented e-learning based on total enrollment of the school ($T(38.54) = 2.91$, $p < .01$). Additionally, removing this district from the study changed the mean enrollment for districts that participated in the study and implemented e-learning to 2,779.22 students with a SD of 2,853.20.

There is a statistically significant difference in school districts that implemented e-learning based on their allocation of resources to have 1:1 devices for every student ($\chi = 18.20$, $p < .01$). Also, 83.9% of school districts that are 1:1 in terms of technology devices for their students reported that they implemented e-learning. Furthermore, 17 of the 31 schools (54.8%) that are not 1:1 in terms of technology for all grade levels did not implement e-learning when school was cancelled due to inclement weather.

There is a statistically significant difference in school districts that implemented e-learning based on their geographic location in the state of Indiana ($\chi = 6.84$, $p < .05$). There were three possible categories for school districts to choose as their geographic location in the state of Indiana: Northern, Central, and Southern. Results from the survey showed that 43 of the 51 (84.3%) Northern Indiana school districts, 36 out of 51 (70.6%) Central Indiana school districts,

and that 11 of 20 (55.0%) Southern Indiana school districts implemented e-learning when school was cancelled due to inclement weather.

There is a statistically significant difference in school districts that implemented e-learning based on their type of location ($\chi = 8.82$, $p < .05$). There were four possible categories for type of location for school districts in the survey: urban, suburban, rural, and town. Seventeen of the 22 (77.3%) school districts that identified as suburban districts, 61 of the 77 (79.2%) school districts that identified as rural school districts, and six of the eight (75.0%) school districts that identified as towns implemented e-learning. Additionally, nine of the 16 (56.2%) school districts that identified as urban did not implement e-learning.

Lastly, the focus of this chapter moves to describing the data regarding research question three. The data presents the identity of the superintendents and examines if superintendents' sensemaking varies according to their identities.

RQ #3: How does superintendents' sensemaking vary according to their own identity?

Eight survey questions were used to determine the identity of Indiana public school superintendents who participated in the study. These eight identifying questions categorized superintendents by age, gender, highest education degree earned, years of experience as a superintendent, years of experience as a superintendent in their current corporation, years of experience as a district level leader before becoming a superintendent, years of experience as a building level leader before becoming a superintendent, and years of experiences as a teacher before becoming a superintendent.

The data from the survey showed that gender was the only identifying category that had a significant statistical difference in the sensemaking of superintendents regarding the decision to implement an e-learning day when school was cancelled due to inclement weather ($\chi = 9.91$, $p <$

.01). At the time of the survey, there were 58 female public school superintendents in Indiana, and all 23 (100%) of the female superintendents who responded to the survey implemented e-learning days when school was cancelled due to inclement weather. There were 120 participants in the study who answered the survey question on gender; 97 of them were male, and 23 were female. Lastly, 74.2% of the male superintendents who participated in the survey (66 out of 97), implemented e-learning.

Chapter Summary

In conclusion, this study of 130 Indiana public school superintendents focused on their sensemaking regarding the decision to implement an e-learning day when school was closed due to inclement weather. An e-learning day occurs when students receive their academic lessons virtually through the use of technology instead of going to school to receive instruction. Indiana school district leaders began implementing e-learning days when school was cancelled due to inclement weather in 2013 and there has been a steady increase in the number of Indiana public school districts that select to use e-learning days. Finally, the open ended question at the end of the survey did not produce any new insight or evidence regarding the sensemaking of superintendents on their decision to implement e-learning.

Chapter 5

This chapter reports a summary of the study and noteworthy conclusions drawn from the data presented in the previous chapter. It provides a review of the sensemaking Indiana public school superintendents use when deciding to implement an e-learning day when school is cancelled due to inclement weather. The chapter ends with recommendations for further research.

Summary of the Study

An emphasis has been placed on the decision making of Indiana public school superintendents due to the vast amount of discretion given to them by the Indiana Department of Education regarding the implementation of an e-learning day when school is cancelled due to inclement weather. There has been a large increase in the number of school districts implementing e-learning, but the sensemaking used by superintendents to make the decision to select an e-learning day to make up lost instructional time is unclear. Additionally, there are variances in implementing an e-learning day among the districts represented by superintendents who choose to select an e-learning day.

Purpose Statement

The purpose of this perceptual study of Indiana school superintendents was to discover superintendents' sensemaking for USC e-learning decision making.

Research Questions

1. What is Indiana public school superintendents' sensemaking regarding implementing an e-learning day when faced with an unscheduled school cancellation due to inclement weather?

2. How does superintendents' sensemaking vary according to school district context?

3. How does superintendents' sensemaking vary according to their own identity?

Review of Methodology

This study draws upon quantitative methods in which a survey based on Karl Weick's Theory of Sensemaking was sent in an email to all 291 public school district superintendents in the state of Indiana. The superintendent sensemaking survey was transferred into Qualtrics which was also used to collect the data for the study. The survey was open for two months beginning in early March, 2020, and a reminder email was sent to non-respondents every other week to complete the survey.

Summary of Findings

RQ #1: What is Indiana public school superintendents' sensemaking regarding implementing an e-learning day when faced with an unscheduled school cancellation due to inclement weather?

There are seven factors of Karl Weick's sensemaking framework: enactment (assumed for this study), selection, retrospective, retention, identity, and ongoing (assumed for this study). Sensemaking begins when an unexpected event causes a disruption to the normal flow of activities. For this study, the disruption is inclement weather that causes superintendents to make the decision for school to be cancelled (enactment). Once Indiana public school superintendents are faced with this disruption, their sensemaking regarding the decision to select an e-learning day begins. Therefore, to answer research question one, superintendent sensemaking will be divided into two groups based on whether or not the superintendents made the decision to implement (selection) an e-learning day. Since research question two focuses on how superintendents' sensemaking varies according to the characteristics of school context, and research question three examines how superintendents' sensemaking varies according to their

own identity, the focus of answering research question one is the sensemaking factors of selection, social, retrospective, and retention.

Selection

The sensemaking factor of selection on the decision making of superintendents is varied. The study found that 70.8% of superintendents responded that their districts implemented e-learning when school was cancelled due to inclement weather. The variation in selection may be understood by the differences in opinions that e-learning is a better option than adding make-up days to the end of the school year (mean=3.75, SD=1.52). While most (69.1%) superintendents in the study agreed that e-learning was a better option 16.3% of superintendents strongly disagreed. Yet, only 34.5% of superintendents who selected to implement an e-learning day when school was cancelled due to inclement weather did so *every* time school was cancelled due to inclement weather.

The variation in selection may be understood by the belief that selecting an e-learning day may be a viable option to replace the cancellation of a single day, but not for consecutive days. The variation in selection can also be seen in the many different ways superintendents have decided to implement e-learning in the plans to return back to school for the 2020-21 school year during the pandemic caused by Covid-19. Furthermore, the variation may be the result of superintendents' concerns that the teaching staff was not capable of providing quality instruction for multiple e-learning days and that the overall effectiveness of staying within the scope and sequence of instruction during e-learning days becomes diminished the more times they are used.

Retrospective

Throughout the sensemaking process regarding implementation of USC e-learning days, superintendents extract cues from their environments and use hindsight to determine if they

made the correct decision. It is not surprising that there is a significant statistical difference between superintendents who implemented e-learning and those who did not in their preference for e-learning days as a better alternative to make-up days added to the end of the school calendar (χ=48.09, $p < .01$). Furthermore, it is not unusual to learn that 68.8% of superintendents who did not implement e-learning disagreed that e-learning was a better alternative than adding make-up days, while 86.4% of superintendents who did implement e-learning agreed that it was a better alternative than adding make-up days.

Additionally, superintendents who believed e-learning to be a better option than adding make-up days believed that their constituents (79.1% of students, 74.7% of parents, and 80% of school board members) had positively responded to e-learning. It can be assumed that if superintendents did not feel their stakeholders responded positively to implementing e-learning, then they would stop selecting to do so.

Social

The sensemaking process is social, and superintendents are constantly accessing and integrating information from their peers, stakeholders, and experts in education. The study found that participating Indiana public school superintendents believed that most of their area school districts selected to implement e-learning (mean=4.03, SD=1.1). Also, 80.0% of superintendents who selected e-learning and 80.7% who did not select e-learning believed that most of their area school districts implemented e-learning when school was cancelled due to inclement weather. Additionally, 62.9% of superintendents who selected e-learning and 46.9% of superintendents who did not implement e-learning reported that they regularly discussed the pros and cons of e-learning with other superintendents before they made their decision to implement e-learning in their district.

Yet, it is surprising that the social factor of sensemaking does not have a statistically significant impact on the decision making of superintendents to implement e-learning. The study showed that superintendents did not agree or disagree (mean=3.07, SD=1.27) that their discussions with other superintendents on the pros and cons of e-learning impacted their decisions regarding e-learning. Additionally, 56.2% of superintendents who selected e-learning and 72.0% of superintendents that did not select e-learning did not agree that the discussions of the pros and cons of e-learning with other superintendents impacted their decision. Also, 59.4% of superintendents from districts that did not implement e-learning and 40.5% of superintendents from districts that did implement e-learning disagreed that the decisions of other area districts influenced their decision regarding e-learning.

This may be explained by an unwillingness of Indiana public school superintendents to admit that their decisions were impacted by the decisions of surrounding school districts. Furthermore, the superintendents in this study may have felt that allowing others to influence their decision making was a sign of weakness and a lack of leadership. Superintendents are responsible for doing what is best for their school districts, and while it is evident that they think about and communicate with other school districts, their responses did not show these social activities impacted their decision making regarding e-learning.

Retention

The sensemaking of Indiana public school superintendents' retention regarding their decision to use e-learning days will continue to increase. The survey showed that 93.1% of superintendents who implemented e-learning days responded that they approved of e-learning and their districts' implemented e-learning days. Additionally, 87.5% of superintendents who implemented e-learning were satisfied with their e-learning policy, while 29.1% of

superintendents who did not implement e-learning were not satisfied with their current district policy.

There is a statistically significant difference in superintendents who approved of e-learning and implemented e-learning in their districts and superintendents who did not implement e-learning in their districts (χ=79.61, $p < .01$). Additionally, 93.1% of superintendents who approved of e-learning, implemented e-learning in their district, and 41.9% of superintendents who did not approve of e-learning did not implement e-learning in their district. Also, there is a statistically significant difference in superintendents who implemented e-learning in their district and their decision to continue or change their existing e-learning policies and superintendents who did not implement e-learning (χ=75.56, $p < .01$). Additionally, 42.5% of superintendents that implemented e-learning are looking to change their e-learning policy only if it can be improved, and 57.4% of superintendents that implemented e-learning are planning to continue their e-learning policies with no changes.

This may be explained by an increase in student access to technology and the internet. As school districts continue to provide professional development and resources to implement technology across the curriculum, superintendents may feel more confident in the effectiveness of e-learning instruction. Next, some superintendents in the study may have believed that the quality of instruction that occurs during make-up days added to the end of the school calendar was not equal to the instruction that could occur through e-learning. Furthermore, the concept of selecting an e-learning day is becoming more acceptable to stakeholders as more school districts implement e-learning days. Finally, adding make-up days to the end of the school calendar does not allow for lost instructional time to be made up before students complete statewide accountability tests. Therefore, superintendents who do not implement e-learning days sacrifice

valuable instructional time that their students would otherwise receive to improve performance on state assessments.

RQ #2: How does superintendents' sensemaking vary according to school district context?

The sensemaking of Indiana public school superintendents varies according to the context of their school districts. For this study, the context of a school district was determined by the total enrollment of the district, geographic location in Indiana, the type of setting the district represents, and if the school district was 1:1 in terms of technology for grades K-12.

There is a statistically significant difference in schools that implement e-learning based on the total enrollment of the school ($T(42.39) = -2.61$, $p < .01$). School districts that have larger enrollments are less likely to implement e-learning than school districts with smaller enrollments. This may be due to school districts with larger enrollments needing more devices, more professional development for their teachers, a lack of internet access in the homes of their students, and larger districts being located in more urban areas with a lower socio-economic status.

There is a statistically significant difference in school districts that implement e-learning based on their allocation of resources to have 1:1 devices for every student ($\chi = 18.20$, $p < .01$). Also, 84.8% of superintendents who implemented e-learning represented districts that were 1:1 for grades K-12, and 53.1% of superintendents who did not implement e-learning represented districts that were not 1:1 for grades K-12. It should not be surprising that these schools are the most equipped to provide virtual learning as every one of their students has access to a device. Additionally, since they are 1:1 with technology, their teachers may be more prepared to provide virtual instruction and their stakeholders more accepting of e-learning.

There is a statistically significant difference in school districts that implemented e-learning based on their geographic location in the state of Indiana ($\chi = 6.84$, $p < .05$). This may be explained by the fact that Northern and Central Indiana on average experience more severe weather, especially amounts of snowfall, than Southern Indiana. Therefore, school districts located in these geographic areas are forced to find a solution for when school is cancelled due to a USC more often than school districts in Southern Indiana. Also, occasionally adding a make-up day to the end of the school calendar may seem more plausible to the stakeholders of Southern Indiana school districts than selecting an e-learning policy for when school is closed due to inclement weather.

There is a statistically significant difference in school districts that implemented e-learning based on the type of setting that their school district represented ($\chi = 8.82$, $p <.05$). There were four possible categories for the type of setting that school districts represented in the survey: urban, suburban, rural, and town. It is not surprising that 77.3% of suburban school districts implemented e-learning when school was cancelled due to inclement weather. This may be because these districts are typically more affluent, have allocated resources to technology for their students and staff, and have greater access to the internet.

It is surprising that 79.2% of school districts in rural areas implemented e-learning for a USC. This may be because rural areas cancel school due to inclement weather more often than the categories studied, thus the instructional disruption was greater, and they were in more need of an alternative to adding make-up days to the end of the school year.

Next, 75.0% of school districts identified as towns implemented e-learning when school was cancelled due to inclement weather. This may be because towns have more accessible internet, smaller enrollments, and resources that can be dedicated to technology.

Finally, 43.8% of school districts identified as urban implemented e-learning when school was cancelled due to inclement weather. This may be because these areas often have schools with large enrollments, a lack of internet access in student homes, and not enough resources to provide technology to all of their students and proper training for their staff.

RQ #3: How does superintendents' sensemaking vary according to their own identity?

The sensemaking of Indiana public school superintendents regarding implementing an e-learning day when school is cancelled due to inclement weather varies slightly according to the identity of the superintendent. The data from the survey showed that gender was the only identifying category that had a significant statistical difference in the sensemaking of superintendents regarding USC e-learning decision-making (χ =9.91, $p < .01$).

This may be due to the fact that 86.3% of female superintendents were from Northern and Central Indiana (the areas hit harder by inclement weather) compared to 81.6% of male superintendents. Also, 73.9% of districts with a female superintendent were 1:1 in terms of technology, 63.3% identified their school district location as rural, and the mean enrollment for their school districts was 3,469.32 with a SD of 3,183.73. The largest school district represented by a female superintendent had an enrollment of 10,576 students compared to the largest school district led by a male superintendent with an enrollment of 22,377 students. The data illustrated that of the nine largest school districts, ranging from 11,473 students to 22,377 students, all led by male superintendents, only 33.3% of them implemented e-learning. The data suggest that all of the school districts led by female superintendents provided optimum organizational characteristics for their female superintendent to select to implement e-learning when school was cancelled due to inclement weather.

Findings Related to the Literature

The decision to implement e-learning when school is cancelled due to inclement weather incorporates the organizing processes of enactment, selection, and retention. The Enactment Theory of Sensemaking aids in understanding the organizing and process of sensemaking that Indiana public school superintendents go through regarding USC e-learning implementation. One role of any superintendent is to continuously keep track of updated weather conditions and determine if they will need to cancel school in their district. The decision to cancel school (enactment) is not an easy one for superintendents to make, and the ecological change caused by inclement weather disrupts the normal flow of the education and prompts superintendents' sensemaking of the situation. If the superintendent determines that school will remain open for the day, the normal flow of education is restored. If the superintendent cancels school, they must then determine (selection) to either select an e-learning day or add days to the end of the school year to reinstate the flow of education. A superintendent bases their selection to try and restore order by extracting cues from the environment and using hindsight from similar situations to determine how they should proceed in this situation (retrospective). Next, the superintendent must decide if they will continue, change, or eliminate (retention) their existing policy the next time school is cancelled due to inclement weather. This decision is based upon the characteristics of their corporation and the plausibility to their stakeholders that their selection was the best way to end the disruption to the flow of education. The entire sensemaking process is ongoing and social as the feedback from the stakeholders of the school district impacts future decisions of enactment and selection when the superintendent is faced with the decision to cancel school due to inclement weather.

Sensemaking is grounded in the personal identity of a person and the characteristics of the organization the decision-maker represents. For this study the characteristics of the public school district that the superintendent represented far outweighed the personal identity of the superintendent. The superintendent represents the district and its stakeholders, and they are constantly evaluating if their sensemaking regarding their decision making is credible to the stakeholders they represent. Therefore, when handling a situation like selecting an e-learning day during a USC, a superintendent defines what is going on and how best to proceed based upon the characteristics of the district they represent.

Unexpected Findings

The most unexpected finding from the study was that 100% of the female superintendents in the study implemented e-learning in their districts. This may be explained by the idea that they represent more progressive districts as indicated by their hiring of a female superintendent, yet, it is still surprising that every district represented by a female superintendent in the study implemented e-learning.

This may also be explained by female superintendents having less experience as a superintendent (mean=5.48, SD 2.66) compared to male superintendents in the study (mean= 9.33, SD 7.82). Therefore the female superintendents in the study may not have been as set in their traditional practices and may have been more willing to try new alternatives to make up for lost instructional time. Additionally, this may be explained by the fact that female superintendents in the study spent more time in the classroom as teachers (mean=10.48, SD 5.38) compared to male superintendents in the study (mean=7.99, SD 3.99). Since female superintendents spent more time in the classroom as a teacher before becoming a superintendent, they may have placed more emphasis on instruction, placed a higher value on staying within the

scope and sequence of a lesson, or put a greater value on making up for lost instructional time before state assessments.

It was also unexpected to find that almost 80% of rural public Indiana school districts implemented e-learning when school was cancelled due to inclement weather. Since internet connectivity, internet speed, and access to technology were much lower in rural areas across Indiana, the expectation would be for these districts to implement e-learning at a much lower percentage. This may be due to the fact that rural students are sometimes needed to work during the summer on farms, and therefore adding days to the end of the school calendar is more problematic than slow technological resources. Additionally, rural Indiana school districts may experience more inclement weather days due to a lack of transportation resources (snow plows, poor roads, etc.), and have larger geographic districts; therefore, they may have a larger need for an alternative to adding days to the end of the school calendar.

Implications for Scholars and Professionals

This study fills a gap in the USC e-learning decision-making research of Indiana public school superintendents. This is the first study that attempts to better understand the rationale used by superintendents regarding the decision to implement e-learning. The data for the study was impacted by the timing of the study as it was completed when many schools were forced to close because of the pandemic of Covid-19. The survey was sent to superintendents at the same time most were making the decision to shut down schools for a short period of time due to the uncertainty caused by the pandemic, but all of the data was collected before the decision was made to close schools for the remainder of the year. Also, because e-learning is a relatively new and controversial topic among Indiana public school superintendents, the data from this study

reflects a snapshot of the current state of e-learning implementation, which will likely change rapidly.

The study revealed that the characteristics of the district have the greatest statistically significant impact on the decision to implement e-learning. Furthermore, the practice of implementing an e-learning day is continuing to increase, and some schools, due to the pandemic, have been forced to make all students learn virtually. Therefore, a better understanding of the rationale to implement e-learning will help other superintendents when faced with similar circumstances and provide them a way to increase quality instructional time before statewide standardized assessments that directly impact their school districts' accountability letter grades.

Recommendations for Further Research

The most surprising finding of the study was that 100% of all female public school superintendents who responded to the survey implemented e-learning in their districts. The data from the survey represented almost half of all the public school female superintendents in the state of Indiana; it would be interesting to learn why female superintendents implemented e-learning at a higher ratio than male superintendents.

Next, there is a gap in the research around the decision making of superintendents who did not implement e-learning for USCs. The survey only allowed respondents additional questions about their sensemaking if they implemented e-learning in their districts. Also, further research could be done to see if there is a difference in the overall accountability grade between districts that implemented e-learning and those that choose to add make-up days at the end of the school year to make up for lost instructional time.

Finally, there is a gap in the research to better understand the reasoning behind the different e-learning policies that exist. Why do some superintendents implement e-learning whenever school is cancelled and others only allow for e-learning on some days that school is cancelled? Furthermore, some superintendents strongly agreed that e-learning was a better alternative to adding make-up days to the end of the school calendar, but still decided to only implement e-learning on some days that school was cancelled.

Concluding Remarks

From the data gathered in this study, the researcher could summarize that an Indiana public school superintendent would be more likely to call an e-learning day if they represented a district from a suburban or rural area, located in North or Central Indiana, with an average enrollment of 3,000 students, and every student was provided a technological device by the school district. An Indiana public school superintendent is less likely to call an e-learning day if they represent an urban district, located in Central or Southern Indiana, with an average enrollment of 5,478 students, and are not 1:1 with technological devices for their students.

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Appendix A

Superintendent Sensemaking Survey

Superintendent Identity Questions

1. What is your gender?
    A. Male
    B. Female

2. What is your age?

3. What is your highest degree obtained?
    a. Bachelors
    b. Masters
    c. Education Specialist
    d. Doctorate

4. How long have you been the Superintendent for the corporation?

5. How many total years' experience do you have as a Superintendent?

6. How many total years did you serve as a district level leader before becoming an Administrator?

7. How many total years' experience did you serve as a teacher before becoming a Superintendent?

8. How many total years' experience did you serve as a building level administrator before becoming a Superintendent?

Identity Question (School District)

9. What school corporation do you represent (Name and IDOE #)?

10. What is the total enrollment of your school corporation?

11. What type of location is your corporation?
    A. Urban
    B. Suburban
    C. Rural
    D. Town

12. Where is your school corporation located in Indiana?
    A. North
    B. Central
    C. South

13. Is your school corporation 1:1 for grades K-12?
    A. Yes
    B. No
14. Is your school corporation 1:1 in terms of technology for grades 7-12?
    A. Yes
    B. No
15. Is your school corporation 1:1 in terms of technology for grades 9-12?
    A. Yes
    B. No

16. Is the device provided by the school district?
    A. Yes
    B. No

17. Is the device rented or owned by the student?
    a. Rented
    b. Owned

18. What type of technological device does your district use for student learning?

Sensemaking Selection Questions

19. Does your district implement e-learning on days of inclement weather?
    A. Yes
    B. No

20. What year did you school corporation begin implementing e-learning days for inclement weather?

    2013-14 _____

    2014-15_____

    2015-16_____

    2016-17_____

    2017-18_____

    2018-19_____

21. On average how many e-learning days did your corporation use when school was cancelled due to inclement weather in the following time periods? (Please only respond for the years in which your school corporation has had an approved e-learning policy)

22. Does your district implement e-learning days for reasons other than inclement weather?
    A. Yes
    B. No
23. On average how many e-learning days does your corporation use per school year for reasons other than when school is cancelled due to inclement weather?

Sensemaking Retrospective Questions

24. In my opinion e-Learning days are a better alternative than adding make-up days to the end of the school calendar day to make up for lost instructional time?

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

25. In your opinion, students in your district have responded positively to the use of e-learning??

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

26. In your opinion, parents in your district have responded positively to the use of e-learning??

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

27. In your opinion, teachers in your district have responded positively to the use of e-learning?

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

28. In your opinion, school board members in your district have responded positively to the use of e-learning?

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

Sensemaking Social Questions

29. Most of the area schools around my district implement e-learning when school is closed due to inclement weather?

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

30. The decision of other area schools around my district to implement e-learning impacts my decision to implement e-learning?

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

31. I discussed the pros and cons of e-learning with other superintendents before making my decision on e-learning for my district?

Strongly agree Agree undecided Disagree Strongly Disagree

32. The discussion on the pros and cons of e-learning with other superintendents impacted my decision to implement e-learning in my district?

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

Selection Questions

33. Check one answer that best describes your e-learning policy

_____Our district implements e-learning whenever school is cancelled due to inclement weather.

_____Our district implements e-learning on some days that school is cancelled due to inclement weather. (For example, not on consecutive days or more than three days in a row)

_____Our district schedules e-learning in the calendar to bank days that will be used in case school is cancelled due to inclement weather but otherwise does not implement e-learning days due to inclement weather.

_____Our district schedules e-learning in the calendar to bank days that will be used in case school is cancelled due to inclement weather and will also hold e-learning days if all the banked days are used up.

_____Our district does NOT implement e-learning when school is cancelled due to inclement weather.

34. Please rank the following inputs in order from (1) as the most important to (6) as the least important factor you considered before making the decision to implement e-learning in your district.

_____Community stakeholder concerns in terms of technology usage for learning

_____Overall connectivity (internet speed) for students in the district

_____Access to the internet for students to complete their e-learning

_____Technology capabilities of the teaching staff

_____Ability of the teaching staff to provide quality instruction with e-learning

_____Students taking home their devices (keeping them from being damaged or lost)

35. Please rank the following factors in order from (1) as the most important to (6) the least important in your decision to implement e-learning

_____Economics (cost savings to the district)

_____Preferable to adding make-up days to the end of the school calendar

_____Pressure from other educational peers

_____Pressure from district stakeholders

_____Safety

_____Instructional Pedagogy (stay in scope and sequence of lessons)

Retention Question

36. Please check the one answer that best describes your position on e-learning

_____I am not in favor of e-learning in any form

_____I am not in favor of e-learning but our district does use e-learning

_____I approve of e-learning and I am happy with our districts e-learning policy

_____I approve of e-learning but I am unhappy with our districts e-learning policy

37. I am satisfied with my districts e-learning policy

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

38. Please check one answer that best describes your district

_____My district has no plans to implement e-learning in the future.

_____My district is considering implementing e-learning in the future but has not yet.

_____My district will is looking to change (to improve) our current e-learning policy.

_____My district will continue using our current policy for e-learning with no changes.

Open Ended Questions

39. Please cite any other reason(s) not listed above that you considered before making the decision to implement (or not implement) e-learning due to inclement weather?

40. If you would like the results of this survey, please answer yes below

A. Yes
B. No