# DISTANCE LEARNING DURING COVID-19: DIFFERENCES IN ENVIRONMENTAL DYNAMICS BETWEEN RURAL AND MAJOR SUBURBAN ELEMENTARY SCHOOLS

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by

Sandra S. Fleming

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by

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## DEDICATION

For my father who taught me that education is valuable, dreams are to be chased, and life is full of lessons to be learned. For my mother who has stood by my side and encouraged me each step of the way, even when I felt I could not go one more step. You picked up the pieces, put me back together, and did not give up on me. Your endless love and support have helped me become who I am today. For my husband,who continued to push me to the end, and refused to allow me to quit, thank you. For my daughter.for whom I started this journey to prove you could do anything you put your mind to. You've encouraged me, even at your young age, to keep going, and you've let me have time away from you to work on school work and research. Your sacrifices have not gone unnoticed. Reach for the stars and follow your dreams. You, too, can do whatever you put your mind to, and I will be there to support you every step of the way.

## ABSTRACT

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COVID-19 forced schools to look at education differently within a matter of days. Some schools were prepared, and education flowed continuously, while others were left scrambling. Numerous initiatives have encouraged distance learning during the quarantine period to help students continue in their education. Utilizing a mixed-methods design, this study looks at elementary schools located in two different types of school districts (major suburban and rural), and the environmental dynamics that affected distance learning during COVID-19 school closures. Teachers from both types of schools were asked to complete a survey with 24 Likert-like items, and four open response items.

The analysis indicated that major suburban schools rated community and home environmental factors higher than the rural schools, showing that they considered community and home factors to be less of a negative impact than their rural counterparts. However, when considering the schools' environmental dynamics, there was only a four-point difference between the major suburban and rural schools' ratings. When the open-ended items were evaluated, three central themes emerged; (a) technology availability and dependability; (b) parental support availability and capability; and finally, (c) teacher training and support.



KEY WORDS: COVID-19, Digital divide, Digital use divide, Distance learning, E-learning, Educational setting, Elementary school, Environmental dynamics, Major suburban, Rural, Technology

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# CHAPTER I

## Introduction

### Statement of the Problem

COVID-19 forced schools to look at education differently within a matter of days. Some schools were prepared, and education flowed continuously, while others were left scrambling. According to Cinteza (2020), COVID-19 has caused one of the most severe pandemics known since we have had clear documentation of pandemics. Briggs (2020) describes COVID-19's arrival as very recent and the speed of its spread as extremely fast. He reports that the virus remains unseen and has already caused a significant economic adversity. According to Madurai et al. (2020), who studied what countries all over the world along with major manufacturers were doing in response to COVID, found that the only way to stop the infection from spreading was by staying at home and avoiding social gatherings, following social distancing and isolating from infected people. The World Health Organization (WHO) (2020) and the Centers for Disease Control and Prevention (CDC) (2020b) agreed. Madurai et al. (2020) stated that stopping the spread would require a combined effort from all social bodies such as the healthcare system, government, and, more importantly, from the public. The rapidly spreading nature of COVID-19 has also caused the shutdown of educational institutions (Madurai et al., 2020; WHO, 2020; CDC, 2020b). E-learning, or distance learning, is a form of learning that primarily occurs over the Internet to address the learning needs of students staying at home. The countries leading the change in online education include US, UK, India, China, and South Korea (Debroy, 2017). Many platforms have been deployed for distance learning such as Google Classroom, Coursera, Udacity, and others. Numerous

initiatives have encouraged distance learning during the quarantine period to help students continue in their education. In some instances, an online session would be livestreamed through video conferencing by the instructor for a group of students. All these technologies have indirectly contributed in helping people to stay at home (Madurai et al., 2020). It is the e-learning (also known as online learning and distance education) of public elementary school students that this research focuses.

The implementation and integration of technology is key in transitioning to distance learning. Schools that have struggled with the implementation and integration of technology may have issues with competing priorities and lack reliable information, resources, and expertise with which to make decisions and guide implementation. Effectively integrating technology to transform teaching and learning requires a willingness to invest in new technologies and technical support, a commitment to ongoing evaluation and adjustments, and continuing professional development. The roles of teacher and learner are evolving to meet the expectations of the 21st century classroom, and so must the systems and policies that support them.

The National Education Technology Plan (NETP) sets a national vision and plan for learning enabled by technology through building on the work of leading education researchers; district, school, and higher education leaders; classroom teachers; developers; entrepreneurs; and nonprofit organizations (U.S. Department of Education, 2017). Learning, teaching, and assessment enabled by technology require a robust infrastructure. Key elements of this infrastructure include high-speed connectivity and devices that are available to teachers and students when they need them. Aside from wires and devices, a comprehensive learning infrastructure includes digital learning

content and other resources as well as professional development for educators and education leaders. According to the U.S. Department of Education (2017), traditionally, the digital divide referred to the gap between students who had access to the Internet and devices at school and home and those who did not. Significant progress is being made to increase Internet access in schools, libraries, and homes across the country. While great strides are being made to close the digital divide, and more and more students are gaining access to devices to use in their day-to-day learning, there still exists a divide many are less aware of (Talaee & Noroozi, 2019). The digital use divide separates students who use technology in different ways. Some students use technology to perform rudimentary tasks and practice basic skills, while others are learning complex computer coding languages and creating complex video games while contributing to the World Wide Web. The digital use divide is present in both formal and informal learning settings and across high- and low-poverty schools and communities of various levels and affluencies (Kormos, 2018). Technology provides new opportunities for traditionally underserved populations to have equitable access to high-quality educational experiences. When connectivity and access are uneven, the digital divide in education is widened, undermining the positive aspects of learning with technology.

According to Deye (2015), policymakers are working to provide all students with high-quality learning options, regardless of where they live or which school they attend. Schools serving low-income families in both urban and rural communities often have fewer resources, which may increase the opportunity and achievement gaps between well-off and disadvantaged students. According to Kormos (2018), who conducted a survey of 2,200 school teachers in a mid-Atlantic state, found significant differences of

usage and perceived effectiveness of technology integration among rural, suburban, and urban school teachers. Urban teachers fell behind the rural and suburban schools in usage and perception of technology in the classroom. This research showed that suburban schools had the highest perceptions of technology effectiveness, followed by their rural peers (Kormos, 2018).

Moreover, Buczynski and Mathews (2016) studied a district in southern California that was highly resourced. The district enrolled approximately 3,100 students each year across two elementary schools, one middle school, one high school, and one alternative school, including a significant number of students from military families. The district had spent the previous two years building an infrastructure in order to support a Bring Your Own Device (BYOD) mobile technology model. The next step was the implementation and integration of this model. Although the teachers consistently understood and embraced the district's vision, they noted a discrepancy between the vision and the schools' capacity to implement it. Teachers held reservations about their ability to implement the vision. The reservations were based on their proficiency integrating technology in the classroom and in what they described as inadequate access to lesson planning time and mobile devices (Buczynski & Mathews, 2016). They further explained that, according to the teachers, differentiating content variety in professional development was not the issue. For the early adopters, their innate motivation to integrate technology into their teaching was stifled by the limited support they received as more advanced teachers. For some teachers, it wasn't that they didn't want to integrate and implement the technology it was: 1) they needed more time, or 2) they needed the confidence to believe they actually could do it. Buczynski and Mathews (2016) explained

that the extent to which teachers felt comfortable in the learning process influenced their willingness and confidence in their ability to integrate technology into their teaching.

This district's move to greater implementation and integration of technology into the curriculum was made easier because resources were already made available to the district via various grants and the school's foundation and the fact that the district's standardized test scores were consistently high. These built-in attributes made it easier to have more flexibility with changing the curriculum and provided leeway to take some risks with technology. Risks could be taken with curriculum innovation because financial backing was available and the pressure to raise state test scores was not in play, whereas some districts might need to shy away risky innovation due to the need to raise state mandated test scores or due to the lack of funding. When teachers are not under pressures from test scores or the lack of funding, it is easier to implement the 21st century learning skills (Buczynski & Mathews, 2016). One teacher in the 2016 study stated, "Within a year we're really going to be teaching a different way because we'll be assessing a different way" (Buczynski, & Mathews, p. 45). This may be true in California, but it is not true across the country. Changes to assessments depend on what state the school is in and how that state chooses to assess learning in their schools. Although this district seemed well-prepared to jump right into full on implementation and integration of technology, several barriers still held them back: the inconsistency of the infrastructure to allow all students access at the same time, keeping devices updated with current software and/or hardware, limited high-quality free apps and resources, and finally professional development for teachers in the integration and implementation and the time they needed

to take that information and work it into their current curriculum and instruction (Buczynski, & Mathews, 2016).

Francom (2016) studied district and classroom factors that could influence barriers to technology integration in public K–12 teachers in a rural, north-Midwestern state. He reported that teachers in rural districts and communities reported more access to technology tools and resources, along with higher levels of administrative support, than did teachers in larger districts and communities. However, the teachers in the larger districts reported more time to plan and prepare for technology integration than their rural counterparts. Francom (2016) classified barriers into two categories: first-order and second-order barriers. First-order barriers were described as barriers external to the teacher, including resources, training, and support, while second-order barriers included those directly tied to the teacher: personal confidence, beliefs about learning, and beliefs about the importance of technology for learning. In his study, respondents from smaller (1,500 students or fewer) school districts reported statistically significantly higher responses in the category of access to technology tools and resources and in the administrative support category. He found similar findings when statistical analysis was run on community size; respondents that worked in school districts within smaller (up to 5,000 people) communities were significantly more likely to report better access to technological tools and resources and better administrative support than those in larger (more than 5,000 people) communities. This suggests that a lack of access to technology tools and resources and administrative support are more significant barriers in larger communities and districts than in smaller communities and school districts (Francom, 2016).

Sheninger (2016) suggests that some schools, built decades ago, were designed for the technology available at that time. Technology would advance at such a rate that just 10 years down the road they would run into construction issues when trying to implement the current technology trends. Some rural schools may struggle with updates to fix these issues due to smaller budgets and less community pressure to renovate.

**Theoretical Framework**

The social cognitive theory originated by Albert Bandura (1977, 1986) is a psychological model highlighting the acquisition of behavior. This theory accentuates that learning, including technology-based learning, occurs under social pretenses. Social cognitive theory represents several rudimentary conventions regarding behavioral learning. The primary assumption is the impression that personal, behavioral, and environmental dynamics have an interrelationship, affecting one another in a mutual approach to learning. Bandura (2001) suggests that this relationship has a substantial impact on an individual's operation as result of the interaction between cognitive, behavioral, and contextual factors. Therefore, the academic environment shapes classroom learning through the reinforcement of factors that influence learners and their communities. Also associated with social cognitive theory is the importance of environment and its effect on behavior.

Due to COVID-19, the environment shifted drastically and at an alarming pace. Schools were no longer operating with students in classes. Students were logging into devices (some for the first time) to interact with their teachers to try and learn their content, while others without access to technology were left with packets and books to

learn with at home. This study aims to explore these environmental dynamics and their impact on learning during the COVID-19 school closures.

As Santarossa et al. (2018) explain, human interaction is the major influence in social and behavioral change; they further studied this with web-based, mobile, social-media behavior change interventions. What they discovered was that human support was the most important component in the effectiveness of both face-to-face and online behavior change interventions, and by thoughtfully introducing a digital person-to-person component to replace the face-to-face interactions, they could provide the needed human support while lowering the barrier of in-person meetings. They further suggested that the digital person-to-person component must create accountability, generate specific feedback, and create genuine social support in order to successfully create behavior change (Santarossa et al., 2018). Barriers to such learning such as attitudes, beliefs, and practices, which are intrinsic to the educator, persist today. These are influenced not only by personal attitudes, but also by social contexts, cultural landscapes, and learned pedagogical practices (Saxena, 2017; Tondeur et al., 2017).

Kim and Park (2018) studied social cognitive theory on key factors influencing an individual's behavior to use e-learning. What they found was that the primary challenges both students and faculty faced in adopting e-learning, as it was termed in this study, were primarily user beliefs, computer access, software, and support. They also noted it was important to look at the user's (student or faculty's) self-belief in their ability to be successful in the online environment. Their research found that self-efficacy is a critical factor affecting individual performance, technology acceptance, and actual use of technology (Kim & Park, 2018). Bao and Han (2019), utilizing social cognitive theory,

investigated the motivations of knowledge sharing in virtual communities. They found that cognitive factors (shared language and shared vision) and outcome expectations (community-related outcome expectations) could produce knowledge sharing in virtual communities. Connections between trust and personality traits were shown to interact with each other in shaping information sharing (Bao & Han, 2019). Schunk and DiBenedetto (2020) described the triadic, reciprocal interactions of the social cognitive theory. They posited that human functioning depends on three interacting sets of factors or influences: behavioral, environmental, and personal. Each set of influences on human functioning affects the others and is in turn affected by them. They believe that what people think then affects their actions and environments; actions and environments in turn influence each other as well as what people think. (Schunk & DiBenedetto, 2020).

A 2017 study by van Deursen et al. suggests looking at the stratification hypothesis, which posits that the process of Internet use mirrors existing social inequalities, because digital networks mirror offline structures and because offline human capital carries over to the online world. Two important ideas behind the stratification hypothesis are amplification and the power law. Amplification suggests that the Internet is a magnifier of existing stratification. Therefore, when inequality in society rises, the Internet tends to reinforce this trend. The power law, a statistical law, in the case of digital inequality, would suggest a polarized distribution in which a growing number of people use the Internet for increasingly varied purposes on high-quality devices, whereas a growing number of people experience this process comparatively slowly. The greater one's capacity, the more the Internet delivers, and the lesser one's capacity, the less value

the Internet has. This leads to widening the gap between the rich and poor (van Deursen et al., 2017).

When looking at two distinctly different classifications of schools (major suburban and rural), this research shows that the environmental dynamics surrounding each school influences the way education is carried out in those schools. For instance, a school that is located near a major university has access to state-of-the-art facilities and content experts that a rural school may not have. Take a close look at a rural school where farming and trade industry is the main source of income and Internet is a luxury, not an expectation. These two schools may have teachers who are equally qualified and administrators of equal caliber, yet when considering the surrounding environment and the communities that support them, it is clear there is a divide. One community has resources to step in and provide support in any way needed, while the other may have the time to give support, but not have the knowledge or resources needed to fulfill the need, or may not have the time due to career demands. When schools were closed due to COVID-19, it was clear that some schools were equipped with infrastructure, training, and hardware in place to immediately shift to distance or e-learning, while other schools were left scrambling to find the funds to get the needed infrastructure and hardware and hoping that their teachers were flexible in training themselves to make the shift to distance or e-learning.

**Purpose of the Study**

There seems to be conflicting thought in current literature on school size and how environmental dynamics affect the integration and implementation of technology. Kormos (2018) described how urban schools faced multiple obstacles to overcome the

digital divide, their larger size, and highly bureaucratic systems that their rural and suburban counterparts do not face, making the case that urban schools were the ones suffering in the case of the digital divide. Talaee and Noroozi (2019) described a "social divide," referring to a gap between information haves and have-nots within a group. Children from poor families, working-class households, or rural communities were less likely to own a home computer or have other kinds of access to digital technologies, making the case that it's the rural communities that are suffering in the case of the digital divide (Talaee & Noroozi, 2019). These are just two examples of conflicting pieces of literature amongst many.

This study looks at elementary schools located in two different types of school districts (major suburban and rural), and the environmental dynamics that affect distance learning during the COVID-19 school closures.

**Significance of the Study**

The purpose of this dissertation was to examine the differences in the environmental dynamics that affect distance learning among rural and major suburban elementary schools during the COVID-19 crisis. Understanding the environmental dynamics of rural and major suburban elementary schools when transitioning to distance learning will enable district leaders to better plan for technology structuring throughout their districts. Leaders in technology for the state will be able to better understand how to facilitate support for these types of schools should another instance occur where schools are forced into distance learning only. Innovators and organizations for change in education can see where the needs are and more specifically how those needs can be met.

## Research Questions

This study will investigate these questions during the distance learning COVID-19 crisis:

1. What are the differences between rural and major suburban elementary school students' community environmental dynamics?
2. What are the differences between rural and major suburban elementary school students' home environmental dynamics?
3. What are the differences between rural and major suburban elementary schools' environmental dynamics?

## Hypotheses

Hypothesis 1: It is hypothesized that the rural schools will have lower levels of community environmental dynamics than the major suburban elementary schools during the distance learning COVID-19 crisis.

Hypothesis 2: It is hypothesized that the rural schools will have lower levels of home environmental dynamics than the major suburban elementary schools during the distance learning COVID-19 crisis.

Hypothesis 3: It is hypothesized that the rural schools will have lower levels of school environmental dynamics than the major suburban elementary schools during the distance learning COVID-19 crisis.

## Definition of Terms

Terms that are important to this dissertation are defined in this section.

**COVID-19**. According to the Center for Disease Control (CDC) (2020a), "on February 11, 2020, the World Health Organization announced an official name for the disease that [was] causing the 2019 novel coronavirus outbreak, first identified in Wuhan

China. The new name of this disease is coronavirus disease 2019, abbreviated as COVID-19. COVID-19 is a new disease, caused by a novel (or new) coronavirus that has not previously been seen in humans. . . . There are many types of human coronaviruses including some that commonly cause mild upper-respiratory tract illnesses. . . . In COVID-19, 'CO' stands for 'corona,' 'VI' for 'virus,' and 'D' for disease. Formerly, this disease was referred to as '2019 novel coronavirus' or '2019-nCoV.'"

**Digital Divide.** The gulf between those who have ready access to computers and the Internet, and those who do not.

**Digital Use Divide.** Digital use divide occurs when students have equal access to technology and Internet but their use of the technology is divided. Some may use it for basic skills such as keyboarding and typing while others use it for coding and uploading new content to the World Wide Web. Thus, the level of the use is divided.

**Educational Setting**. The Texas Education Agency (TEA) (2017a) defines educational setting as the location where teaching and learning takes place.

**E-Learning.** E-learning is learning conducted via electronic media, typically on the Internet.

**Environmental Dynamics.** For the purpose of this study, the term "environmental dynamics" will focus solely on the access to and support of online digital learning opportunities.

**Major Suburban**. The TEA (2018) defines a major suburban district, of which there are 79, as a district that:

> (a) does not meet the criteria for classification as major urban; (b) it is contiguous to a major urban district; and (c) its enrollment is at least 3 percent that of the largest contiguous major urban district or at least 4,500 students. A district also is

> classified as major suburban if: (a) it does not meet the criteria for classification as major urban; (b) it is not contiguous to a major urban district; (c) it is located in the same county as a major urban district; and (d) its enrollment is at least 15 percent that of the largest major urban district in the county or at least 4,500 students.

**Higher-Level Thinking**. Thinking occurs on a continuum from knowledge level to evaluation level, higher-level thinking takes place at the top of the hierarchy of cognitive processing and may include problem solving, decision making, investigation, and reflective thinking.

**Implementation**. The Merriam-Webster (n.d.) defines implementation as "the process of making something active or effective." This study will define implementation as the act of acquiring technology for the purpose of integration.

**Integration**. The TEA (2017) defines integration as "the use of technology by students and teachers to enhance teaching and learning and to support curricular objectives."

**Rural**. The TEA (2018) defines a rural districts, of which there are 459, as a district that:

> does not meet the criteria for classification in any of the previous subcategories. A rural district has either: (a) an enrollment of between 300 and the median district enrollment for the state and an enrollment growth rate over the past five years of less than 20 percent; or (b) an enrollment of less than 300 students.

**Technology**. The TEA () gives the following examples to define technology: computer workstations, laptop computers, wireless computers, handheld computers,

digital cameras, probes, scanners, digital video cameras, televisions, telephones, digital projectors, programmable calculators, interactive white boards.

**Delimitations**

A convenience sample from schools classified as rural and major suburban was selected for participation in the survey process for teachers. The study was restricted to only those who submitted survey responses.

The researcher is a teacher from a rural elementary school in Texas.

**Limitations**

Due to the study only including those surveys submitted from a convenience sample, sample size is a limitation. Future investigations could include a more comprehensive sample size and reach out to include administrators, parents, students, and other educational stakeholders.

**Assumptions**

This research study is based on the assumption that the participants answered the survey questions in an honest and candid manner. If this assumption were not satisfied, the data may not have produced accurate information.

**Organization of the Study**

This research study began as a comparison between rural and major suburban elementary school technology use and student performance. Then, COVID-19 happened and changed many things including this research. Suddenly teachers, were forced into teaching from a distance and in ways never thought of before. This research still compared rural and major suburban elementary schools and technology, but the focus turned to how environmental dynamics of the home, community, and school impacted

distance learning. This mixed-methods study was carried out through a teacher survey with 24 Likert-type items and four open response items. The data was collected, analyzed, and reported through this dissertation.

# CHAPTER II

## Review of the Literature

### Technology Standards

According to Passey et al. (2018), the education system is where most individuals will develop digital life skills to function as citizens in the digital society and employees in the digital economy. In 2017, the state of Texas adopted the International Society for Technology in Education's (ISTE) standards, "a framework for students, educators, administrators, coaches and computer science educators to rethink education and create innovative learning environments" (Smith, 2017). According to Smith (2017), the standards focus on the promise technology has for empowering learning. Standards focus around seven prominent areas in education: learners, leaders, citizens, collaborators, designers, facilitators, and analysts. ISTE CEO Richard Culatta describes the standards as a vision for using technology to create next-generation learning environments to empower learners (Smith, 2017).

Texas' State Board of Education (SBOE) has legislative authority to adopt the Texas Essential Knowledge and Skills (TEKS) for each subject of the required curriculum. The technology applications TEKS are found in the Texas Administrative Code (TAC), Title 19, Part II, Chapter 126, and include "Beginning with School Year 2012–2013" in the title.

### Technology Impact

In the 1990s, one computer was available for every 20 students. Today, that ratio has lowered to one computer for every two students in U.S. public schools (Herold, 2016). Recent studies have shown a positive connection between technology integration

and increased student achievement (D'Aprile, 2017; Montgomery, 2017). Kuyatt et al. (2015) conducted a study to determine the effect of technology implementation on student academic success. The researchers collected English language arts (ELA) and social studies scores from the State of Texas Assessment of Academic Readiness (STAAR) assessment from Region 2 Education Service Center schools. According to the surveys, there was a significant difference in the relationship of STAAR scores and teachers who use technology in the classroom.

**Technology Equity**

Papendieck (2018) argues that it is time to shift the discussion from "technology for all to technology for what" (p.5). In a time where much of the discourse about technology and change in education is framed in terms of access and participation, both measures of "formal equality leave us significantly short of achieving goals of substantive equity" (p. 5). According to Smith (2016), digital equity is a complex issue that reflects other inequities: socioeconomic concerns and inequalities of types of devices and Internet connections. Passey et al. (2018) commented how research on young people's technology use suggests that their abilities to access digital technologies remain patterned strongly along lines of socioeconomic status and social class. Hohlfeld et al. (2017) suggests that socioeconomic differences are the primary determinant of inequality because of unequal distribution of economic resources, lack of opportunities to build human capital, and unavailable social resources. Distribution of technology involves issues of school finance, equity, and adequacy.

Digital equity is an expensive issue to consider. Guided by the district technology plan, school district officials are also accountable to school boards and the local

communities. Determining the location of and scheduling the distribution of technology among schools within a school district involves decisions that are socially and politically influenced. Many organizations are working to level the field when it comes to financing digital equity in public education, like the Federal Communications Commission (FCC) who started the E-rate program (LaGow, 2019). Based on the Telecommunications Act of 1996, the FCC created the E-rate program to provide schools and libraries affordable access to advanced telecommunications services (LaGow, 2019). The E-rate program, also known as the Universal Service Schools and Libraries Program, is administered by the Universal Service Administrative Company (USAC) (LaGow, 2019). This program provides discounts ranging from 20 to 90 percent on telecommunications services, Internet access, internal connections, and basic maintenance of internal connections to eligible schools and libraries (LaGow, 2019). Many others are working to ensure equal access to technology in schools, but there is still much to be done. Barrett (2013) states that the examination of the current status of technology tools is an essential first step toward ensuring all Texas students are afforded equitable access to the technology tools needed for learning and for preparing to flourish in the 21st century. According to Passey et al. (2018), "equitable distribution of digital agency in a society is in the first place a moral demand to sustain and strengthen a democratic state of a society standing upon digital technology" (p. 433).

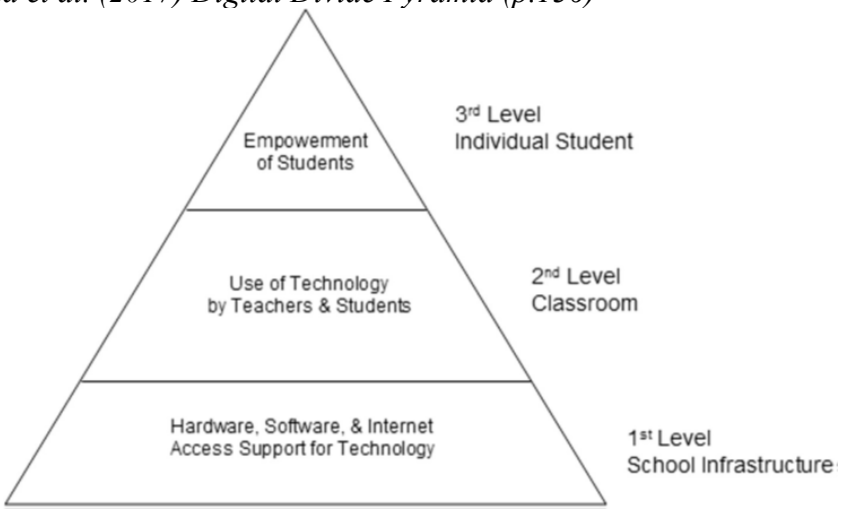
A study of school equity in Nevada by Verstegen (2015) found inequalities and wide disparities in revenue for schools linked to local wealth. The most shocking data showed that the range in spending among local districts was over $74,000 per pupil. While funding supports opportunities generally (e.g., for quality teachers, smaller class

sizes, instructional materials, administrative leadership, support systems and programs), technology was not specifically mentioned or studied here.

Hohlfeld et al. (2017) discussed establishing a pyramid framework (see Fig. 1) for conceptualizing the school substructures potentially impacting and impacted by the digital divide. They go on to suggest that the digital divide in schools can be experienced at three levels. These levels are hierarchical, because an equitable outcome at each level supports a student having equitable participation in the next level; however the levels can also be mixed depending on the environment, for example: a student may experience digital divides at all three levels while using different ICT tools during different instructional activities (e.g., math and social studies) (Hohlfield et al., 2017).

**Figure 1**

*Hohlfeld et al. (2017) Digital Divide Pyramid (p.136)*




Hohlfeld et al. (2017) used this pyramid to examine statewide data from Florida related to ICT access (Level One), frequency of use (Level Two) and purpose of use (Level Three) across schools of different SES. Their primary research questions were: 1) how equitable is access to hardware and software within Florida public elementary, middle, and high schools across SES statuses (high vs. low) (level one), and 2) How does SES (high vs.

low) impact the frequency and purpose of use of technology by students and teachers within the classrooms of Florida public elementary, middle, and high schools (level two)? After analyzing data Hohlfeld et al. (2017) found some evidence that would suggest that there are some inequities at Level One and Level Two. They go on to predict that the Level One and Level Two concerns will lead to differences at Level Three in Florida's schools. However, this particular research did not investigate differences at the third level because, according to Hohlfeld et al., research on the third level "is difficult to conduct, because it involves observations of the self-directed activities of students using ICT tools, investigating how and why students are using these tools, and examining how teachers prepare learning environments which best support these activities" (p. 150).

Papendieck (2018) states that historical efforts for equality within and through our public educational systems have also been met with limited substantive success. He believes that true transformative technology integration—"that is, technology integration that goes against status quo to change schools and society for the better—requires both a critique of oppression and substantive action for social justice" (p. 1). Talaee and Noroozi (2019) analyzed theoretical frameworks to describe digital divide. Through much of their research, one centralized factor was family SES. This factor had an impact not only on home computer access, but also usage (Talaee & Noroozi, 2019). Thus, in much research, the new "digital divide" takes into account not only access but also how the computers are being used. The lower SES families are seeing usage in skill practice and basic recall of facts, while the higher SES families are seeing usage in creating and sharing of resources to further educational impact. Therefore, the new "digital divide" takes educational output into consideration (Talaee & Noroozi, 2019).

Sims (2017) provides insight into the nature of the disconnect between technology-driven reform and actual school change, documenting what he calls “cycles of disruptive fixation” (p. 11). According to Sims, well-meaning philanthropists tend to start these cycles by forming alliances with educational experts and insiders to implement idealistic technological reform, and as these interventions tend to be high profile and politically risky, there is on the other hand pressure for academic success, often in terms of traditional standardized state tests. That is when the new technology then becomes co-opted to support traditional learning and practices. Standing in for real reform, technology-driven change is collectively elaborated, celebrated, and “paradoxically” used as justification for further techno-idealistic intervention (Sims, 2017). Sims writes that such cycles of disruptive fixation are recurrent in the history of techno-philanthropic education reform in this country (2017). Papendieck (2018) writes, “This question of the civic and social mission of schooling in America brings us to the second of our two vexing observations: formal efforts to make our schools and society more just and equitable are rarely met with substantive success” (p. 2).

Papendieck (2018) argues that the history of American education is that of competing and often contradictory goals, of “shifting priorities” and “pendulum swings”. On one hand, it is idealistic to identify goals like equality and to pursue it; it is quite different however to understand how the goal does or does not operate in such political educational settings to bring about change. Equity and social justice do not come by declarating and acting on formal goals of equality alone (e.g., integration, diversity, inclusion, participation) but also requires resource redistribution and the cultivation of new technology literacies (Papendieck, 2018). Introducing new technologies and

curricula into classrooms without a deep understanding of the inequities and injustices that currently exist within these spaces will lead to the same cycle of unfulfilled promises of digitally inspired reform (Philip & Olivares-Pasillas, 2016). Papendieck (2018) states that technologies are never just tools or neutral media, but rather manifestations of our attitudes, assumptions, and realities in this world. To look strictly at technologies as instruments does not take into account how sociopolitical agendas are transmitted through those technologies into our classrooms. It does not account for how, in the context of a status-quo socio-technical infrastructure of schools, technology instruments exclude and marginalize by design.

At the same time, technology is often described as an overwhelming force, one with no escape. Virtual reality becomes the future, and society urges teachers and schools to keep up or be left behind. Papendieck (2018) writes, "In this *substantivism* view, technology is not seen as a benign set of instruments, but rather amounts to a value-laden, totalizing force that dominates and instrumentalizes the substance of our culture and society itself" (p. 4). This way of thinking of technology as an unstoppable force goes against the very nature and ability to make change.

Papendieck (2018) describes how a critical perspective on technology, on the other hand, simultaneously recognizes the value of technologies and techniques as well as human agency in their design and use. Technology does not on its own contribute to truly transformative goals or ideals of equity and social justice in educational contexts. Users must understand individual technologies and their use in context in order to uncover how they are implicated in the mirroring and oppressive society, and also how they might be used to actively pursue change.

**Barriers to Technology**

Overall spending for educational technology in American schools has exceeded $630 billion, which comes out to approximately $12,608 per student (Herold, 2016). According to Kormos (2018), public schools in rural and urban areas and their spending are as unique and diversified as the communities they educate. The disparity in funding among school districts has led to a "digital divide" among students. The digital divide describes the inequality in access to technology that exists between communities due to regional and demographic differences, particularly socioeconomic groups. Previous research has shown that rural and urban schools encounter more challenges related to school funding, and technological resources, than other schools (Kormos, 2018).

Barriers extrinsic to the educator, such as Internet access, sufficient bandwidth, and access to technology hardware, have been lowered in the United States. However, barriers such as attitudes, beliefs, and practices, which are intrinsic to the educator, are still persistent. These are influenced not only by personal attitudes, but also by social contexts, cultural landscapes, and learned pedagogical practices (Saxena, 2017; Tondeur et al., 2017).

Van Deursen et al. (2017) suggest looking at the stratification hypothesis, which posits that the process of Internet use mirrors existing social inequalities because digital networks mirror offline structures and because offline human capital carries over to the online world. Two important ideas behind the stratification hypothesis are amplification and the power law. Amplification suggests that the Internet is a magnifier of existing stratification so that when inequality in society rises, the Internet tends to reinforce this trend. The power law suggests a polarized distribution in which a growing number of

people use the Internet for increasingly varied purposes on high-quality devices, whereas a growing number of people experience this increase in using the Internet comparatively slowly. The greater one's capacity, the more the Internet delivers, and the lesser one's capacity, the less value the Internet has. This leads to widening the gap between the rich and poor (van Deursen et al., 2017).

Kormos (2018) reported that rural schools struggle more with limitations brought upon by slow bandwidth than urban and suburban schools. Slower Internet speeds may limit a teacher's access to instructional materials such as images, videos, and document downloads (Kormos, 2018). In Kormos' study of a mid-Atlantic state, K–12 public school teachers' access to technology, frequency of use, and perceived effectiveness, found that the mean score for urban teachers was higher than rural and teachers when considering teacher satisfaction with access to technology. When considering web-based communication tools, urban teachers reported the lowest average frequency of use, while rural teachers were most likely to use the technology on a daily basis. Although each group had similar mean scores, urban teachers had a higher standard deviation. Kormos believed that this could suggest that there is a larger gap in use within the urban classroom (2018).

Durff and Carter (2019) conducted a qualitative multi-case study in which three groups of educators were interviewed to determine how some teachers overcame barriers to technology integration. They found that educators face attitudinal, sociocultural, and pedagogical barriers to technology integration in spite of its positive impact on academic achievement. Each of their cases studied two or three teachers, an administrator, and one technology support person in each of the three rural schools. Their findings suggested

that a team approach among administrators, technology support personnel, and teachers resulted in the strongest technology integration. They found that appropriate professional development, collegial support, sharing among teachers, training teachers to locate relevant technological resources, and establishing value and support for the use of technology for learning were the most successful strategies (Durff & Carter, 2019).

**Rural vs. Major Suburban Schools**

According to Goldchain (2019), one in five students in U.S. public elementary and secondary schools live in a rural area and are more overlooked when it comes to technology reform in education than their peers in non-rural communities. Goldchain (2019) also reported that, according to the senior director of the ACT's Center for Equity in learning:

> It is important to look at rural students as a group and what they do and don't have access to with regards to technology . . . because in the education conversation, rural students make up a huge group of the education population, but they're often excluded from the conversation.

According to the United States Department of Education (2019), technology can be integral to significant improvements in student achievement. Technology supports both teaching and learning by infusing classrooms with digital learning tools, such as computers and handheld devices, that expand learning materials and experiences. Technology also builds 21st century skills while increasing student engagement and motivation. The United States Department of Education reinforces that "technology has the power to transform teaching by ushering in a new model of connected teaching" (2019).

In 2017, the state of Texas adopted the International Society for Technology in Education's (ISTE) standards, "a framework for students, educators, administrators, coaches and computer science educators to rethink education and create innovative learning environments" (ISTE, 2019). According to ISTE (2017), the standards focus on the promise technology has for empowering learning. Standards focus around seven prominent areas in education: learners, leaders, citizens, collaborators, designers, facilitators, and analysts. ISTE CEO Richard Culatta describes the standards as a vision for using technology to create next-generation learning environments to empower learners (Smith, 2017).

Texas' State Board of Education (SBOE) has legislative authority to adopt the Texas Essential Knowledge and Skills (TEKS) for each subject of the required curriculum. The technology applications TEKS are found in the Texas Administrative Code (TAC), Title 19, Part II, Chapter 126, and include "Beginning with School Year 2012–2013" in the title. Although national and state standards promote the integration of technology in the curriculum, educational technology integration lacks a democratic approach because school districts have varied advantages and limitations that affect the integration of technology within their individual school districts. Public schools in rural and urban areas are as unique and diversified as the communities they educate. The disparity in funding among school districts has led to a "digital divide" among students. The digital divide describes the inequality in access to technology that exists between communities due to regional and demographic differences, particularly socioeconomic groups (Kormos, 2018).

According to the Texas Education Agency (TEA) (2018), school districts are grouped into eight subcategories, ranging from major urban to rural, based on factors such as enrollment, growth in enrollment, economic status, and proximity to urban areas. This study will focus on two of the eight subcategories. The Texas Education Agency (TEA) (2017a), classifies a district as a major suburban district, of which there are 79, if it:

> (a) does not meet the criteria for classification as major urban; (b) it is contiguous to a major urban district; and (c) its enrollment is at least 3 percent that of the largest contiguous major urban district or at least 4,500 students. A district also is classified as major suburban if: (a) it does not meet the criteria for classification as major urban; (b) it is not contiguous to a major urban district; (c) it is located in the same county as a major urban district; and (d) its enrollment is at least 15 percent that of the largest major urban district in the county or at least 4,500 students.

TEA defines rural districts, of which there are 459, as:

> rural if it does not meet the criteria for classification in any of the previous subcategories. A rural district has either: (a) an enrollment of between 300 and the median district enrollment for the state and an enrollment growth rate over the past five years of less than 20 percent; or (b) an enrollment of less than 300 students.

Compared to other states, Texas has the highest percentage of schools located in rural areas (TEA, 2017) and the greatest number of rural students attending public schools (Showalter et al. 2017). According to Robinson et al., in 2017, a higher percentage of

children in rural areas than children in urban areas lived in a poor or near-poor households, as well as lived in a household where the highest adult education level was a high school education or less. They also reported that children in large and small rural areas more often lived in families with financial difficulties than their peers in urban areas. Children in all rural areas more often lacked amenities such as parks, recreation centers, sidewalks, and libraries in their neighborhood than children in urban areas and more often lived in a neighborhood in poor condition. The study found more reports of children living in unsafe neighborhoods in rural areas than that of children in urban areas (Robinson et al., 2017).

**Socioeconomic Status**

According to Dolan (2017), research on the implementation of technology in K–12 schools shows that there are significant divides in the way in which technology is utilized, influenced by the differences in the socioeconomic status of the students and the schools they attend. Public school districts continue to increase investment in student devices such as laptops, tablets, interactive white boards, program subscriptions, and other technologies in order to better educational outcomes and student growth toward college and career preparedness (Bakir, 2015; Mccandless, 2015; Schaffhauser, 2016). According to Schaffauser (2016), spending for education technology is increasing, while overall teacher training and tech support budgets have dropped. Bakir (2015) found that researchers lack reliable data regarding the implementation and effects of technology used in schools, which he calls a side effect due to money haphazardly dumped into school districts for educational technology, rather than being carefully allocated. In the absence of careful planning to address specific problems in education, spending money

on tech will not be the solution. It is then essential to understand the relationship between educational technology expenditures, the integral connection of effective implementation strategies, and student performance.

**School and Classroom Environments**

Another implication of a widening opportunity gap is that some students do find success within the school environment, where their use of in-school technology is utilized and implemented conducive to creativity, exploration, and collaboration, while still others lack the opportunity to use technology in productive ways, and are being sheltered from experiences to utilize technology in ways that will prepare them for the world outside of education (Vareberg & Platt, 2018). According to Serumu Igberadja (2017), the study of basic technology has helped to reduce the ignorance of technology because it provides opportunities to students to use tools that are used in the workplace and it provides skills that help the learners to handle any project or problem handed to them. Students who have acquired basic technology skills have more advantages to post-education opportunities than those who do not (Igberadja, 2017). According to Igberadja (2017), the major goal of technology education is to prepare students to be productive citizens, giving them the skills, knowledge,  and attitudes related to the needs and problems of their immediate environment. Quality technology education should focus on all aspects of the education process, including teacher, student, community and environmental factors (Igberadja, 2017).

According to Buczynski and Mathews (2016), an urban school district in southern California launched an initiative to enact 21st century learning skills via mobile learning technology in its elementary, middle, and high schools. The area’s stakeholders believed

21st century learning could only happen with 21st century teaching. The district implemented effective and efficient teaching as their vision to accomplish this goal. It was noted that both teachers' and administrators' practice needed to change in order to prepare students for post-education opportunities. The aim was to shift pedagogical practice while enhancing student learning experience through implementation of data-driven curriculum and a Bring Your Own Device (BYOD) policy and implementation of individual learning plans. Cloud technology was the enabler of "smart" mobility. With access to the cloud, all files are housed on the Internet rather than being stored in the classroom. This allowed accessibility to project materials and all data sources for revision and collaboration anytime and anywhere (Buczynski & Mathews, 2016).

On the other hand, according to Vareberg and Platt (2018), there are challenges specific to rural school districts: the age of the school, which may not allow for technology infrastructure, smaller budgets for updates, and less community pressure to renovate cause the rural schools fall behind their counterparts. Rural schools deal with connectivity issues that most urban schools do not, simply due to geographic location. These difficulties potentially create a gap between urban and rural students when it comes to technology education (Vareberg & Platt, 2018). According to Showalter et al. (2017), "more than one in four of American's public schools are rural, and nearly one in six of the nation's students are in rural areas" (p. 1). Given the fact that most secondary education organizations have the same expectations from all students, the aforementioned challenges of rural schools will put these students at a disadvantage when compared to urban students (Vareberg & Platt, 2018).

The urban district studied by Buczynski and Mathews (2016) is a highly resourced district in southern California. The district enrolls approximately 3,100 students each year across two elementary schools, one middle school, one high school, and one alternative school, including a significant number of students from military families. The district has had the personnel and time to have spent the last two years building a "device agnostic" infrastructure in order to support a BYOD mobile technology model. After spending two years building the infrastructure, they are now able to focus on use of the devices and the integration of the devices into the curriculum. This is a common trend among urban schools. They have the time and personnel to plan, schedule, and implement large-scale technology plans (Buczynski & Mathews, 2016).

**Technology in the Classroom**

Another mitigating factor is teacher pedagogical beliefs about, and training in, technology (Dolan, 2017). Many educators and policy makers believe that technology is the key to richer, more highly personalized, and more collaborative learning experiences for all students (U.S. Department of Education, 2019). National reports show that, due to this trend, teacher technology use has increased steadily over the past five years (Bill & Melinda Gates Foundation, 2015). The Bill & Melinda Gates Foundation continues to conduct research, which is guided by their single premise: no one knows how technology can and should be used in classrooms better than the teachers who put it to use every day (Bill & Melinda Gates Foundation, 2015). According to the Bill & Melinda Gates Foundation's 2015 research, teachers spent an average of 16 percent of instructional time on independent practice without using digital content, compared to 11 percent of independent practice that not did use digital content. Another 16 percent of class time

was spent on paper-and-pencil assessment, compared to 9 percent on computer-based assessment, and 10 percent was devoted to individual, in-person tutoring, compared to 4 percent on online tutoring (Bill & Melinda Gates Foundation, 2015).

**E-Learning**

Rice and Deschaine (2020) define online learning as instruction and content that primarily occurs over the Internet. According to the Evergreen Group (2017), public school, K–12 students enroll in online courses for many reasons, including credit recovery, extending the school year, accessing courses that would not normally be available in a school or district, and reducing scheduling conflicts. Because of the wide array of reasons for taking online courses, many K–12 students will find themselves in an online course as part of their primary or secondary school experience. Rice and Deschaine (2020) report that K–12 online course passing rates fall behind that of face-to-face settings in many programs. For example, Freidhoff (2015) reported that during the 2013–2014 academic year, students in Michigan completed or passed only 57% of their online courses, in contrast with 71% of their face-to-face courses.

The need for preparation requires additional urgency because online teaching requires different skills than traditional teaching (Pulham & Graham, 2018). In addition to instructional skills, online teachers must develop strategies for building relationships with and evaluating the personal, social, and academic needs of students they do not see or interact with daily (Rice & Deschaine, 2020). According to the Houston Chronicle (2020), more than 42% of students failed one or more courses in the first six weeks of the 2020–2021 school year in the Greater Houston area (Carpenter). In Houston ISD, the state's largest district, 42 percent of students failed one or more classes in the first

marking period, up from about 11 percent on average. Cy-Fair ISD, the region's second-largest district, reported 41 percent of online-only middle and high school students failed at least one class, compared to 15 percent of those attending in-person instruction. In Aldine ISD, one of the region's biggest and highest-poverty districts, nearly half of freshmen, sophomores and juniors failed at least two classes, triple the previous year. Meanwhile, about 25 percent of middle school students received at least two F grades, about five times higher than 2019–2020 (Carpenter, 2020). Carpenter (2020) reported that educators say accountability to attend classes online is lacking, along with support to complete assignments. Educators noted that while students continued to connect with teachers via Zoom and download coursework, parents and other family members were not nearly as successful as teachers in ensuring assignments gets done (Carpenter, 2020).

**Teacher Effectiveness**

According to Kormos (2018), urban schools face obstacles on multiple fronts to overcome the digital divide. Urban districts are generally larger than rural districts, but they work under a typically high bureaucratic system, which can hamper the implementation and consistency of technology integration. Teacher self-perception related to technology in urban schools is different from others, as urban schools are more likely to employ teachers with low levels of self-efficacy and training in using educational technology. There is a gap in teacher preparedness related to educational technology. Teachers of color in urban schools are twice as likely to have not received adequate training, skills, and knowledge to use technology in an educational context too (Kormos, 2018). These differences impact how technology is used in the classroom. Similar to urban districts, high poverty rates are common in rural settings, which has a

negative impact on teacher salaries and technological resources. In addition, many rural schools encounter problems with teacher turnover and shortages (Kormos, 2018). Kormos (2018) also adds that the small size of rural schools offers benefits for teachers and students. Teachers in rural schools have reported high levels of autonomy and greater work satisfaction. In addition, teacher-student relationships have been found to be typically closer than those in urban schools (Kormos, 2018).

Montgomerey (2017) studied a comprehensive high school centrally located in a suburban county in Maryland and found that personal interest, availability, and professional development had the greatest influence over a teacher's decision to integrate technology. Durff and Carter (2019) found that by recognizing the value of integrating technology, educators were propelled to find ways to overcome any barriers that dissuaded them from using technology with their learners. Teachers showed more willingness to use technology themselves than to turn the technology over to their students to demonstrate learning. Durff and Carter found that teachers and students recognized how their technology skills developed over time and that there was a need for adaptability in lesson design especially when technology did not work the way they had planned. Teachers in this research stressed the importance of effective professional development and peer support to help move beyond the fear of using technology (Durff & Carter, 2019). These researchers further found that offering technology support to teachers without the stigma of requiring software or hardware use would make it feel "safer" and allow for teacher buy-in. Teacher attitudes were more negative when technology was mandated, regardless of its value to their curriculum (Durff & Carter, 2019).

**Teacher Training**

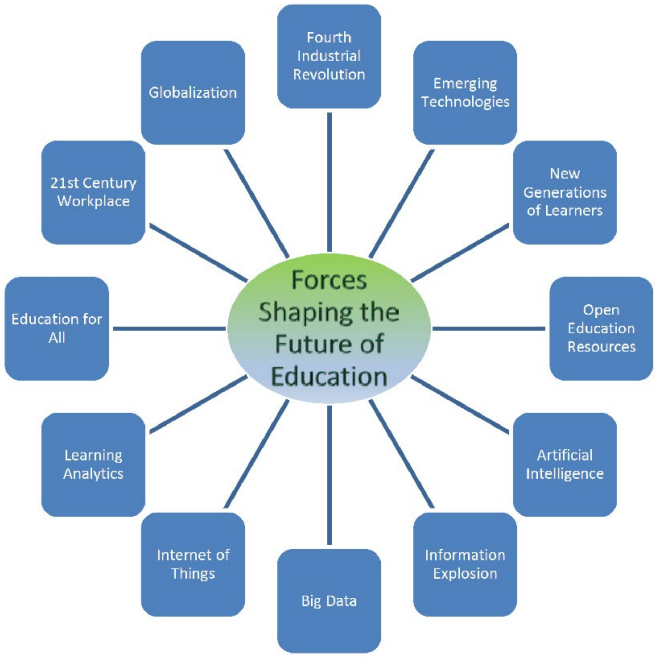
Transitioning to online learning requires incredible shifts in teacher thinking, and online schools struggle against the persistent opinion that people who have never taught online can migrate to an online context with little or no preparation and be immediately successful (Rice & Deschaine, 2020). Even when teacher educators are made aware of specific skills necessary for teaching online, access to teacher preparation for online learning is difficult. Rice and Deschaine (2020) describe that the difficulty arises from online teacher preparation programs disagreeing about what topics should be covered. One study of online teachers found that online teachers reported no online preparation whatsoever (Rice, 2017).

Hamlin and Leslie (2019) state the biggest obstacle in online teaching is "replicating that same feeling of togetherness that one feels in an in-person classroom to an online class" (p. 13). Through a study of a team-teaching approach, where one teacher was the content expert and the other the technology guru, Hamlin and Leslie (2019) found that traditional teaching, where teachers and departments work on their own without collaboration was stifling to innovation and adaptation to a fast-paced changing environment. Hamlin and Leslie (2019) propose teaching designs that have flexible teams to be innovative and adjust to the needs of students: "the journey to innovation occurs through collaboration" (p. 16). A team-based approach to teaching can produce better learning outcomes and support not only for students but for teachers as well. According to Ally (2019), professional development will be increasingly important for teachers in the digital age so that they may stay abreast of quality and flexible education strategies for more sophisticated learners. Teachers will be required to be even more of a facilitator

of learning and fluent and flexible with emerging technologies. Ally (2019) describes how teachers must be prepared to educate the current and upcoming generations of learners, who are technology literate and are accustomed to digital gaming and high-quality videos, thus requiring teachers to be comfortable using educational games and social media as innovative and interactive strategies for teaching. Ally (2019) mentions a variety of forces that are shaping the future of education, forces which will impact the skills required by teachers to provide quality education and support to learners (see Fig. 2).

**Figure 2**

*Forces Shaping the Future of Education*




According to Ally (2019), digital teachers will need to have some general qualities that will allow them to provide quality support virtually to learners. Ally (2019) further identified digital teacher competencies in the areas of using digital technology,

developing digital learning resources, remixing learning resources, communicating, facilitating learning and pedagogical strategies, and assessing learning and personal characteristics. Teachers in rural areas tend to lack the resources required to obtain these competencies and are in schools where funding for training for these competencies is not seen as a priority and where other needs outweigh the time and dedication it would take to achieve such goals. On the other hand, administrators in major suburban areas have resources to distribute training and personnel to readily implement support for teachers to assist in the acquisition of the competencies required of a digital teacher. Ally (2019) identified the general competencies for the digital teacher of the future (Figure 3).

**Figure 3**

*Digital teacher general competencies*

| | | | | |
|---|---|---|---|---|
| **A. General** | A1. Be comfortable working in a virtual environment. | A2. Provide support of learners regardless of location and time. | A3. Work from anywhere and at any time. | A4. Teach students life skills. |
| | A5. Keep up with emerging learning technologies to use in education. | A6. Keep current in the content area to facilitate learning. | A7. Encourage students to be good citizens. | A8. Basic knowledge of artificial intelligence. |
| | A9. State of the art (current) knowledge in the subject area. | A10. Collaborate virtually with other teachers to share information on learners' progress. | A11. Share effective learning practices with other teachers. | A12. Prepare learners to live in harmony with the environment. |

In regards to technology preparation, schools are even more diverse than teacher preparation programs. Teachers' pre-training may be similar, but the continuing education and professional development offered by the individual school districts is a

different story. This explains the difference in the implementation and integration of technology in the schools, possibly as an issue of priorities.

# CHAPTER III

## Methodology

### Introduction

This chapter provides detailed information on the methodology for this study. First, it discusses the research questions, followed by the rationale for conducting a mixed-methods research study and the study design, including a description of the survey. This is followed by reviewing the theoretical framework, research questions, research setting, and participants. Lastly, the data collection procedures and the methods of analysis are discussed.

### Research Questions

This study investigates these questions during the distance learning COVID-19 crisis:

1. What are the differences between rural and major suburban elementary school students' community environmental dynamics?
2. What are the differences between rural and major suburban elementary school students' home environmental dynamics?
3. What are the differences between rural and major suburban elementary schools' environmental dynamics?

### Research Hypotheses

Hypothesis 1: It is hypothesized that the rural schools will have lower levels of community environmental dynamics than the major suburban elementary schools during the distance learning COVID-19 crisis.

Hypothesis 2: It is hypothesized that the rural schools will have lower levels of home environmental dynamics than the major suburban elementary schools during the distance learning COVID-19 crisis.

Hypothesis 3: It is hypothesized that the rural schools will have lower levels of school environmental dynamics than the major suburban elementary schools during the distance learning COVID-19 crisis.

## Research Design

### Convergent Parallel Mixed Methods Design

According to Piccioli (2019), a convergent parallel mixed methods design is most appropriate when merging quantitative results and qualitative findings during analysis and/or interpretation to develop a complete and valid understanding of the subject matter. Sahin and Öztürk (2019) further explain that the purpose of convergent parallel mixed methods is to collect and combine quantitative and qualitative data simultaneously and report the findings of the analysis to understand the research problem better. Sahin and Öztürk (2019) explain that this method allows for one data set to compensate the weaknesses of the other, thus providing a more comprehensive response to the research problem. Headley and Plano Clark (2020) describe mixed methods as a way to intentionally incorporate both qualitative and quantitative data as analytical tools for the purpose of transcending the conclusions warranted by either a qualitative or quantitative approach alone.

### Qualitative Research Methods Design

This study utilized open-ended questions embedded in a survey to gather participants' thoughts on distance learning during COVID-19. According to Turale

(2020), qualitative research is well suited to studies that involve mixed methods or questionnaires, or where there is a need to develop straightforward, firsthand descriptions of facts and phenomena. Turale (2020) is quick to mention that description drives this type of research. According to Creswell and Creswell (2018), in phenomenological research, the researcher describes the experiences of a phenomenon as described by the participants. According to Flynn and Korcuska (2018), phenomenology is grounded in constructionism, and theoretically, it is a subcategory of interpretivism. The goal of including the open-ended qualitative questions in this study is to be able to describe how environmental dynamics impacted distance learning during COVID-19 through the eyes of the participants.

**Quantitative Research Methods Design**

This study utilized a survey consisting of 24 statements that participants responded to with a Likert-like scale. Creswell and Creswell (2018) suggest that survey designs provide quantitative description of trends, attitudes, and opinions of populations, or tests for associations among variables of a population. According to Bloomfield and Fisher (2019), research studies that are used to describe variables and examine variables in two or more groups are referred to as comparative descriptive design. Findings from descriptive research are most valuable for describing a particular phenomenon which is new, or about which very little is known (Bloomfield & Fisher, 2019). Bloomfield and Fisher (2019) further state that correlational research aims to determine whether two or more variables are related and, if so, to discover the nature of the relationship. The findings are then expressed in statistical form (Bloomfield & Fisher, 2019).

This study was conducted through a survey of teachers that included both quantitative and qualitative measures. Due to the nature of the study, it was important to the researcher to gather as much information as possible about the subject matter to gather a "whole picture" of the issues at hand during COVID-19 distance learning.

**Data Analysis**

Data was collected using the Qualtrics platform. Qualitative data was recorded and coded for confidentiality. Quantitative data was analyzed using IBM SPSS Statistics for Windows.

**Internal Consistency**

In order to protect internal consistency, surveys were sent out at the same time. One of the most widely used tests for internal consistency is Cronbach's Alpha, which is conducted to determine if the surveys accurately measure what they were designed to measure. A reliability coefficient of .70 or higher is considered "acceptable" in most social science research today (UCLA, n.d.). This test was the first one to be run before conducting any other tests.

**ANOVA**

According to Slate and Rojas-LeBouef (2011), ANOVA is used to test differences between sample means, test whether any number of means differ, look at the interacting effects of two or more variables, and compare variability within and between experimental groups to test differences between means. When conducting an ANOVA, it is assumed that scores are normally distributed within each population, variances among the populations being compared are equal, and the dependent variable is measured on an interval or ratio scale of measurement (Slate & Le-Bouef, 2011). According to Bevans

(2020), a two-way ANOVA with interaction tests three null hypotheses at the same time: there is no difference in group means at any level of the first independent variable, there is no difference in group means at any level of the second independent variable, and the effect of one independent variable does not depend on the effect of the other independent variable (a.k.a. no interaction effect). Because this study has two independent variables and three dependent variables, according to Bevans (2020), there are three different models to consider: a two-way ANOVA without any interaction or blocking variable (an additive two-way ANOVA), a two-way ANOVA with interaction but with no blocking variable, and finally a two-way ANOVA with interaction and with the blocking variable. Bevans (2020) suggests that running all three versions of the two-way ANOVA and then comparing the three models will efficiently test which variables and which combinations are important for describing the data.

**Coding**

Belotto (2018), who studied job satisfaction and employment longevity in the field of Emergency Management Systems (EMS), through a qualitative, phenomenological design for the method of inquiry, found that analyzing qualitative data should begin by structural coding, coding responses with terms that are related to the research questions. Belotto (2018) also included descriptive labels to include "the essence of what he was hearing" (p. 2625). This allowed for a second, more descriptive level of coding, which would provide useful further into analyzation. Using Microsoft Word, Belotto highlighted text (a method of color coding) and utilized comments in the margins to keep track of coding methods. The margins and codes allowed for creation of the content analysis table and analyze aggregate data. The patterns that emerged led to

categories. Handling coding this way, allowed for creation of primary and secondary themes for the tables (Belotto, 2018). According to Creswell and Creswell (2018), there are typically eight steps researchers take when developing codes for qualitative data: get a sense of the whole and jot down ideas as they come to mind, pick one document at a time and think about the underlying meaning of the content and write thoughts in the margins, make a list of topics from the notes in the margins, cluster similar topics, abbreviate the topics as codes and write the codes next to appropriate segments of the text, find the most descriptive wording for the topics and turn them into categories, and assemble and alphabetize the codes.

**Narrative Descriptions**

Another qualitative method Creswell and Creswell (2018) describe is using rich, thick descriptions to convey the findings. This not only allows the researcher to offer many perspectives about a theme, but also the results become more realistic and vivid, and this procedure adds to the validity of the findings. According to Ford (2020), utilizing narrative forms of qualitative research can be powerful tools for change if approached with caring reflexivity. “Storying stories” or other forms of narrative inquiry provide avenues through which the researcher can listen to their colleagues’ lived experiences (Ford, 2020, p. 243). Ford (2020) explains that narrative inquiry work is time-consuming and rewarding in its ability to bring about the expanse of human experience and allow reflections on future experience narratives. Analyzing the qualitative data through a narrative inquiry lens allows the researcher the opportunity to examine the humanistic experience and reflect that in the data analysis and reporting (Ford, 2020).

A combination of ANOVA through IBMs SPSS software and systematic coding of the open-ended response items was utilized to analyze the data collected from the surveys.

**Participant Selection**

Using TEA's classification system, districts were narrowed down to only those classified as rural and major suburban. Using geographic data, school districts with similar COVID-19 response rates were selected to be contacted. Principals were emailed information about the research along with a request for permission to conduct the surveys with their teachers. Once permission was granted, teachers were emailed a link to complete the survey. Three schools from each district type agreed to participate, for a total of six schools.

**Instrumentation**

A survey was created to contain eight statements from each environmental dynamic being considered (home, school, community) that had impacts on how distance learning was accessed and supported during the COVID-19 school closures. Teachers were asked to use a seven-point Likert-like scale to respond to each of the 8 items for each section (1 = strongly disagree, 2= disagree, 3 = somewhat disagree, 4 = neither agree nor disagree, 5 = somewhat agree, 6 = agree, and 7= strongly agree*)* for data collection purposes (see Appendix A). There are also four places for teachers to openly respond to statements concerning the conditions of the distance learning within each section, and any additional information they wanted to provide was accepted there.

**Procedure**

Approval to conduct this dissertation was requested from the Sam Houston State University Institutional Review Board following approval by this researcher's dissertation committee. Once approval was received from both sources, data obtained from the Texas Education Agency Public Education Information Management System was accessed, and schools that were identified as major suburban and rural were sent correspondence about participation in this research.

Once permission to survey teachers was given, teachers at the designated schools were sent an email about the research and a link to the survey. Prior to the start of the survey, a written ethics information document was provided along with a statement of consent that explained the rights of the participants. Protection of confidentiality and anonymity of the participants was explained, and their right to withdraw from the study was described prior to the start of the survey (see Appendix B). If participants declined to participate, they were thanked for their time and the survey closed. Once participants gave consent, the survey began. The participants moved through the survey until the end.

When all surveys were complete, the data was downloaded into SPSS. The independent variables were rural elementary school and major suburban elementary school, and the dependent variables were the environmental dynamics: the community, the home, the school. The open-ended questions were sorted for word frequency counted, and then the responses were coded.

Prior to conducting a two-way ANOVA, a test for internal consistency was performed using Cronbach’s Alpha in SPSS. If the coefficient was .70 or higher, it was considered acceptable. Then the data was checked to meet six assumptions. The first

assumption is that the dependent variables should measure at the continuous level (i.e., they are interval or ratio variables), and since the survey used a Likert-like scale to measure these, this assumption is met. Assumption two is that the two independent variables should each consist of two or more categorical, independent groups; the independent variables, which were rural elementary schools and major suburban elementary schools, satisfied the second assumption. The third assumption is independence of observations, which means that there is no relationship between the observations in each group or between the groups themselves. For example, there must be different participants in each group with no participant being in more than one group, which is satisfied by sending emails out to specific schools in each of the two separate categories. The fourth assumption is that there are no significant outliers. To check this, the researcher ran descriptive statistics and produced histograms and box-plots to determine if any outliers were present. The fifth assumption is that the dependent variables should be approximately normally distributed for each combination of the groups of the two independent variables. This check is accomplished by running a Shapiro-Wilk test for normality in SPSS. The final assumption is that there needs to be homogeneity of variances for each combination of the groups of the two independent variables; this is checked with a Levene's test for homogeneity of variances in SPSS.

After checking the assumptions, the two-way ANOVA was conducted using SPSS. Because this study had two independent variables and three dependent variables, according to Bevans (2020), there were three different models to consider: a two-way ANOVA without any interaction or blocking variable (an additive two-way ANOVA), a two-way ANOVA with interaction but with no blocking variable, and finally a two-way

ANOVA with interaction and with the blocking variable (Bevans, 2020). Bevans (2020) suggests that by running all three versions of the two-way ANOVA and comparing the three models, one can efficiently test which variables and which combinations are important for describing the data. The tables produced when running the two-way ANOVA in SPSS, table titled "Tests of Between Subjects Effects," were able to tell if there was statistical difference between the rural and major suburban elementary schools and the environmental dynamics of home, community, and school. The other tests suggested by Bevans (2020) would have added depth to the research but were not necessary to answer the research questions. They might add to additional research.

Finally, the open-ended response items were grouped by topic and independent variable and coded for frequently used words and themes. For validity purposes, member checking and peer debriefing were utilized to enhance the accuracy of the coding. Then these were tied back to the research questions, and a discussion was reported about the participants' narratives on the environmental dynamics impacting distance learning during COVID-19.

# CHAPTER IV

## Results

### Introduction

The purpose of this mixed methods study was to examine the differences in the environmental dynamics that affected distance learning among rural and major suburban elementary schools during the COVID-19 crisis. This chapter includes results from tests performed on the data obtained from the survey results according to the research questions. This study surveyed 64 pre-K through fifth grade elementary teachers. These teachers were asked to rate 24 statements with a Likert-like scale and were given the option to respond to four open-ended statements. Of the 64 teachers, 43 were from major suburban elementary schools in Texas, and 21 were from rural elementary schools in Texas.

A reliability coefficient of .70 or higher is considered "acceptable" in most social science research today (UCLA, n.d.). After uploading data into IBM SPSS, a test of internal consistency was performed for each of the three dependent variables (home, community, and school environmental dynamics) and the survey questions associated with them. Table 1, where N represents the eight survey items associated with each research question, research question one's Cronbach's Alpha of .888 gives reliability to these survey items. Research question two's Cronbach's Alpha of .868 gives reliability to those eight survey items, and research question three's Cronbach's Alpha of .873 gives reliability to those eight survey items.

**Table 1**

*Research Questions Reliability Statistics*

| Research Question | Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|---|
| RQ1 | .888 | .884 | 8 |
| RQ2 | .868 | .871 | 8 |
| RQ3 | .873 | .862 | 8 |

Prior to conducting further inferential statistical procedures, checks for normality of data were conducted. For each research question, the standardized skewness coefficients (i.e., skewness divided by the standard error of skewness) and the standardized kurtosis coefficients (i.e., kurtosis divided by the standard error of kurtosis) revealed no deviation from +/- 3, as suggested by Onwuegbuzie and Daniel (2002). There was one extreme data point for the major suburban group, as assessed by boxplot; the assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances ($p$ = .016) (see Table 2).

**Table 2**

*Research Questions Levene's Test of Homogeneity of Variances*

| Research Question | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|
| RQ1 | 6.157 | 1 | 62 | .016 |
| RQ2 | 3.406 | 1 | 62 | .070 |
| RQ3 | .630 | 1 | 62 | .430 |

Even with this violation, Field (2018), contends that the parametric ANOVA is sufficiently robust that it can be withstood.

## Research Questions

### *Research Question One*

Research question one asked, what are the differences between rural and major suburban elementary school students' community environmental dynamics?

A one-way ANOVA was conducted to determine where there was a difference in students' community environmental dynamics for schools with different school populations (major suburban and rural). Data was normally distributed for each group, as assessed by Shapiro-Wilk test ($p > .05$) (see Table 3).

**Table 3**

*Research Question 1 Shapiro-Wilk Test of Normality*

| | Shapiro-Wilk | | |
|---|---|---|---|
| Group | Statistic | df | Sig. |
| Major Suburban | .966 | 43 | .228 |
| Rural | .912 | 21 | .061 |

Data is presented as mean ± standard deviation. Scores are derived from a seven-point Likert scale and are summated by a composite of responses to eight survey items about the communities' ability to provide access to and support of online digital learning opportunities during COVID-19 school closures. A mean score of woul would signify a strong disagreement to the statements, 16 would signify a disagreement to the statements, 24 would signify somewhat of a disagreement, 32 would signify a neutral feeling, 40 would signify somewhat of an agreement, 48 would signify an agreement, and 56 would

signify a strong agreement to the statements by the respondents. The major suburban elementary students' community environmental dynamics mean score of 44.09 with a standard deviation of 6.98 was higher than the rural elementary students' community environmental dynamics mean score of 34.05 with a standard deviation of 10.68 (see Table 4).

**Table 4**

*Research Question 1 Descriptive Statistics*

Dependent Variable: RQ1

| Group | Mean | Std. Deviation | N |
|---|---|---|---|
| Major Suburban | 44.09 | 6.979 | 43 |
| Rural | 34.05 | 10.684 | 21 |
| Total | 40.80 | 9.555 | 64 |

Because there was not homogeneity of variances, the Welch ANOVA was used. The difference between students' communities' environmental dynamics was statistically significantly different for different school populations, Welch's $F(1, 28.61) = 15.36$, $p = .001$ see Table 5.

**Table 5**

*Research Question 1 Welch Statistic*

| | Robust Test of Equality of Means | | | |
|---|---|---|---|---|
| | Statistic | df1 | df2 | Sig. |
| Welch | 15.363 | 1 | 28.612 | .001 |

The following table shows the item statements from the survey for research question one and the percentage of respondents that selected each rating (1=strongly disagrees, 2=disagrees, 3=somewhat disagrees, 4= neither agrees nor disagrees, 5= somewhat agrees, 6= agrees, and 7=strongly agrees) from both the major suburban and rural school groups.

**Table 6**

*Research Question 1 Survey Item Response Rate Percentages*

| | | Percent Rating | | | | | | |
|---|---|---|---|---|---|---|---|---|
| During distance learning in the community… | School Group | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Internet is readily available in most areas of my school zone. | Major Suburban | 0 | 2 | 7 | 2 | 30 | 35 | 23 |
| | Rural | 14 | 33 | 5 | 0 | 33 | 10 | 5 |

(continued)

| | | Percent Rating | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Internet is reliable on a regular basis in all areas of my school zone. | Major Suburban | 0 | 2 | 12 | 0 | 33 | 33 | 21 |
| | Rural | 10 | 43 | 10 | 0 | 10 | 14 | 14 |
| Internet cost is made affordable to all students in my school zone. | Major Suburban | 0 | 5 | 9 | 26 | 30 | 19 | 12 |
| | Rural | 10 | 38 | 19 | 14 | 5 | 10 | 5 |
| Technology is available to use for learning purposes. | Major Suburban | 0 | 2 | 7 | 0 | 26 | 35 | 30 |
| | Rural | 5 | 19 | 19 | 0 | 14 | 29 | 14 |
| When I need assistance with technology, help is easy to find. | Major Suburban | 0 | 5 | 0 | 2 | 21 | 35 | 37 |
| | Rural | 5 | 0 | 10 | 10 | 48 | 14 | 14 |
| I know someone who knows how to help me with technology. | Major Suburban | 0 | 5 | 2 | 0 | 14 | 40 | 40 |
| | Rural | 5 | 0 | 0 | 0 | 14 | 57 | 24 |

(continued)

| | | Percent Rating | | | | | | |
|---|---|---|---|---|---|---|---|---|
| I can help others when then need help with technology. | Major Suburban | 0 | 2 | 7 | 0 | 35 | 42 | 14 |
| | Rural | 0 | 10 | 5 | 5 | 43 | 24 | 14 |
| There is a local place where you can get help with technology. | Major Suburban | 0 | 9 | 7 | 19 | 16 | 30 | 19 |
| | Rural | 14 | 38 | 5 | 10 | 10 | 10 | 14 |
| *Note:* 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neither agree nor disagree, 5 = somewhat agree, 6 = agree, and 7= strongly agree. | | | | | | | | |

Further investigation led to another one-way ANOVA to determine if there was a difference in students' community environmental dynamics by the different grade levels represented (pre-K through fifth grade). There was one extreme data point for the fifth-grade group, as assessed by boxplot; the assumption of homogeneity of variances was not violated, as assessed by Levene's test for equality of variances ($p$ = .257) (see Table 7).

**Table 7**

*Research Question 1 by Grade-Level Levene's Test of Homogeneity of Variances*

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| RQ1 | Based on Mean | 1.333 | 6 | 57 | .257 |

Data was normally distributed for each group, as assessed by Shapiro-Wilk test ($p > .05$) (see Table 8).

**Table 8**

*Research Question 1 by Grade-Level Shapiro-Wilk Test of Normality*

| | | Shapiro-Wilk | | |
|---|---|---|---|---|
| | Grade Level | Statistic | df | Sig. |
| RQ1 | Pre-K | .926 | 4 | .572 |
| | Kinder | | | |
| | 1st | .901 | 10 | .224 |
| | 2nd | .911 | 8 | .361 |
| | 3rd | .891 | 12 | .122 |
| | 4th | .943 | 13 | .493 |
| | 5th | .932 | 15 | .292 |

Data is presented as mean ± standard deviation. The students' community environmental dynamics scores varied among the grade levels with first and fourth grade

being the lowest: Pre-K ($M$ = 45.25, $SD$ = 6.185), first ($M$ = 43.50, $SD$ = 17.678), second ($M$ = 41.13, $SD$ = 9.357), third ($M$ = 40.25, $SD$ = 8.281), fourth ($M$ = 36.31, $SD$ = 11.693), and fifth ($M$ = 45.20, $SD$ = 8.152) (see Table 9).

**Table 9**

*Research Question 1 by Grade-Level Descriptive Statistics*

| Grade-Level | N | Mean | Std. Deviation |
|---|---|---|---|
| Pre-K | 4 | 45.25 | 6.185 |
| Kinder | 2 | 43.50 | 17.678 |
| 1st | 10 | 38.10 | 8.582 |
| 2nd | 8 | 41.13 | 9.357 |
| 3rd | 12 | 40.25 | 8.281 |
| 4th | 13 | 36.31 | 11.693 |
| 5th | 15 | 45.20 | 8.152 |
| Total | 64 | 40.80 | 9.555 |

The difference between students' community environmental dynamics was not statistically significantly different for different grade levels, $F(6, 63) = 1.368$, $p = .243$. See Table 10.

**Table 10**

*Research Question 1 by Grade-Level ANOVA*

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 723.915 | 6 | 120.653 | 1.368 | .243 |
| Within Groups | 5028.444 | 57 | 88.218 | | |
| Total | 5752.359 | 63 | | | |

## Qualitative Findings

After participants rated the eight survey items, there was an open-ended item in which respondents had the option to answer. It read, "Is there anything unique about how your community handled learning and meeting the needs of students during the schools being shut down due to COVID-19 that you feel would be important for others to know?" After, the responses were grouped by independent variable and coded for frequently used words and themes. The codes and themes were member-checked and peer-debriefed for validity purposes and to enhance accuracy.

**Major Suburban.** The most frequent codes were: (a) providing technology was helpful but not without limitations, (b) training teachers, students and parents, (c) paper packets, (d) providing lunches, and (e) community expectations. Over half of the major suburban teachers who responded mentioned providing technology to the students was beneficial, but not without its limitations. As one teacher put it,

> Our district provided hotspots to students who did not have access to Internet. Remote teachers were denied hotspots. Students who are new to

the school and designated as remote learners can check out a district laptop but it could be a few days before they obtain the device.

One-third of the major suburban teachers reported the need for training in the use of devices for teachers, students, and parents. They also mentioned training in the use of programs for delivering instruction online during this time: “Teachers spent personal time training to operate on a virtual format. Our district gave us one day of training on one platform. Everything else was self-taught.”

Other items mentioned by the major suburban teachers were the use of paper packets for some learners, the schools providing lunches for students to pick up (meeting other needs than just learning), and the feeling the teachers had that the community expected more of them during this time: “this community wants teachers to have full responsibility of their child’s education.”

**Rural.** The most frequent codes were: (a) paper packets, (b) community hot spot zones, (c) buses utilized, (d) communication, and (e) training. One-third of the rural respondents spoke about providing paper packets to families without access to technology. One respondent said that, “work at my level should involve improving fine motor skills and many families didn’t have reliable printers or often even computers to access work.”

Another third of respondents mentioned loaning out technology to families in need, and one respondent mentioned community centers providing hot spot zones where rural students could go to get online. One teacher mentioned how their school utilized the buses to take packets and lunches to the students in the rural areas. Accountability was described as problematic because, “students were not being held accountable by the

district to do what they needed to do regardless as to the many hoops the staff was doing to meet all needs, teach, and keep all lines of communication going EVERYDAY." Other issues of communication, and training were mentioned by the rural participants.

***Research Question Two***

Research question two asked, what are the differences between rural and major suburban elementary school students' home environmental dynamics?

A one-way ANOVA was conducted to determine if there was a difference in students' home environmental dynamics for schools with different school populations (major suburban and rural). There were four extreme data points for the major suburban group, as assessed by boxplot; the assumption of homogeneity of variances was not violated, as assessed by Levene's test for equality of variances ($p = .070$) (Table 11). Furthermore, data was normally distributed for each group, as assessed by Shapiro-Wilk test ($p > .05$) (Table 12).

**Table 11**

*Research Question 2 Levene's Test of Homogeneity of Variances*

| | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|
| RQ2 | 3.406 | 1 | 62 | .070 |

**Table 12**

*Research Question 2 Shapiro-Wilk Test of Normality*

| | | Shapiro-Wilk | | |
|---|---|---|---|---|
| | Group | Statistic | df | Sig. |
| RQ2 | Major Suburban | .959 | 43 | .127 |
| | Rural | .970 | 21 | .732 |

Data is presented as mean ± standard deviation. The major suburban students' home environmental dynamics mean score of 37.84 with a standard deviation of 7.18 was higher than the rural students' home environmental dynamics mean score of 27.52 with a standard deviation of 9.25 (see Table 13).

**Table 13**

*Research Question 2 Descriptive Statistics*

| Dependent Variable: RQ2 | | | |
|---|---|---|---|
| Group | Mean | Std. Deviation | N |
| Major Suburban | 37.84 | 7.178 | 43 |
| Rural | 27.52 | 9.245 | 21 |
| Total | 34.45 | 9.236 | 64 |

The difference between students' home environmental dynamics was statistically significantly different for different school populations, $F(1, 62) = 24.024$, $p < .001$ (see Table 14).

**Table 14**

*Research Question 2 ANOVA*

RQ2

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 1500.761 | 1 | 1500.761 | 24.024 | .000 |
| Within Groups | 3873.099 | 62 | 62.469 | | |
| Total | 5373.859 | 63 | | | |

Table 15 shows the item statements from the survey for research question two and the percentage of respondents that selected each rating (1=strongly disagrees, 2=disagrees, 3=somewhat disagrees, 4= neither agrees nor disagrees, 5= somewhat agrees, 6= agrees, and 7=strongly agrees) from both the major suburban and rural school groups.

**Table 15**

*Research Question 2 Survey Item Response Rate Percentages*

| | | Percent Rating | | | | | | |
|---|---|---|---|---|---|---|---|---|
| During distance learning in the student homes… | School Group | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| All students have access to technology to access learning online at home. | Major Suburban | 5 | 12 | 12 | 2 | 26 | 28 | 16 |
| | Rural | 33 | 29 | 14 | 10 | 14 | 0 | 0 |
| Students are capable of navigating the Internet to complete assignments at home. | Major Suburban | 2 | 19 | 12 | 0 | 40 | 19 | 9 |
| | Rural | 14 | 14 | 29 | 10 | 29 | 5 | 0 |
| Students communicate with their teachers through online platforms (Dojo, SeeSaw, Class Craft, Google Classroom, Edmodo, Canvas, Blackboard, Remind, etc¦). | Major Suburban | 2 | 0 | 5 | 0 | 33 | 49 | 12 |
| | Rural | 5 | 19 | 5 | 5 | 24 | 43 | 0 |

(continued)

| | | Percent Rating | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Students access video conferencing tools (Zoom, Google Meet, Google Hangouts, Skype, Facetime, etc) to participate in academic conversations with peers and teachers. | Major Suburban | 0 | 2 | 2 | 0 | 28 | 51 | 16 |
| | Rural | 5 | 33 | 10 | 0 | 29 | 24 | - |
| There is a designated time for learning each day and a parent or guardian available to help monitor focused time on task. | Major Suburban | 2 | 9 | 14 | 14 | 26 | 26 | 9 |
| | Rural | 10 | 48 | 19 | 10 | 10 | 5 | 0 |

(continued)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parents can help students navigate learning online and provide support when needed. | Percent Rating | | | | | | | |
| | Major Suburban | 2 | 5 | 21 | 14 | 47 | 9 | 2 |
| | Rural | 10 | 10 | 52 | 10 | 5 | 10 | 5 |
| Parents or guardians are available to help with learning. | Major Suburban | 2 | 12 | 26 | 21 | 28 | 9 | 2 |
| | Rural | 10 | 29 | 29 | 10 | 14 | 10 | 0 |
| Parents or guardians are capable of helping with learning. | Major Suburban | 5 | 5 | 16 | 23 | 37 | 9 | 5 |
| | Rural | 5 | 19 | 19 | 10 | 38 | 10 | 0 |

*Note:* 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neither agree nor disagree, 5 = somewhat agree, 6 = agree, and 7= strongly agree.

Further investigation led to another one-way ANOVA to determine whether there was a difference in students' home environmental dynamics by the different grade levels represented (Pre-K through fifth grade). There were two extreme data points for the fifth-grade group, as assessed by boxplot; the assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances ($p$ = .049) (see Table 16).

Even with this violation, Field (2018) contends that the parametric ANOVA is sufficiently robust that it can be withstood. Data was normally distributed for each group, as assessed by Shapiro-Wilk test ($p > .05$) (see Table 17).

**Table 16**

*Research Question 2 by Grade-Level Levene's Test of Homogeneity of Variances*

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| RQ2 | Based on Mean | 2.268 | 6 | 57 | .049 |

**Table 17**

*Research Question 2 by Grade-Level Shapiro-Wilk*

| | | Shapiro-Wilk | | |
|---|---|---|---|---|
| | Grade Level | Statistic | df | Sig. |
| RQ2 | Pre-K | 1.000 | 4 | 1.000 |
| | Kinder | | | |
| | 1st | .951 | 10 | .679 |
| | 2nd | .889 | 8 | .228 |
| | 3rd | .928 | 12 | .358 |
| | 4th | .964 | 13 | .811 |
| | 5th | .932 | 15 | .290 |

Data is presented as mean ± standard deviation. The students' home environmental dynamics scores varied among the grade levels with Kinder being the highest: pre-K (*M* = 35.00, *SD* = 3.367), Kinder (*M* = 49.50, *SD* = 9.192), 1st (*M* = 33.90, *SD* = 9.171), 2nd (*M* = 34.38, *SD* = 9.797), 3rd (*M* = 33.33, *SD* = 7.620), 4th (*M* = 30.15, *SD* = 12.341), and 5th (*M* = 37.33, *SD* = 6.114) (see Table 18). The difference between students' home environmental dynamics was not statistically significantly different for different grade levels, $F(6, 63) = 1.752$, $p = .126$ (see Table 19).

**Table 18**

*Research Question 2 by Grade-Level Descriptive Statistics*

| | N | Mean | Std. Deviation |
|---|---|---|---|
| Pre-K | 4 | 35.00 | 3.367 |
| Kinder | 2 | 49.50 | 9.192 |
| 1st | 10 | 33.90 | 9.171 |
| 2nd | 8 | 34.38 | 9.797 |
| 3rd | 12 | 33.33 | 7.620 |
| 4th | 13 | 30.15 | 12.341 |
| 5th | 15 | 37.33 | 6.114 |
| Total | 64 | 34.45 | 9.236 |

**Table 19**

*Research Question 2 by Grade-Level ANOVA*

| RQ2 | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 836.892 | 6 | 139.482 | 1.752 | .126 |
| Within Groups | 4536.967 | 57 | 79.596 | | |
| Total | 5373.859 | 63 | | | |

### *Qualitative Findings Regarding Home Environmental Dynamics*

After participants rated the eight survey items, there were two open-ended items that respondents had the option to answer. Part one asked, "What needs were unique to your students' families that may not have been mentioned above that you feel would be important for others to learn from?" and part two asked, "Are there any concerns you have about families during school shut-down situations that you would like to share?"

**Major Suburban Part 1.** The most frequent codes were: (a) technology issues, (b) lack of parental support, (c) students left alone or with siblings, and (d) diverse student needs. Fourteen of the 28 responses mentioned students having trouble with technology and not having parents home during the day to help, or students having to help siblings because parents were working so they are not only having to do their school but also take care of younger siblings as well. Eighteen of the responses mentioned students needing support of some kind in getting online to do the work or in getting the

work turned in. One teacher said, “Some households do not provide direct supervision and support for remote students. Many students do not have a distraction-free spot in their home for online classes.” Another said, “Some of my 3rd graders were left home to take care of younger siblings (aged less than a year at times) while parents worked.”

Five of the comments mentioned lack of technology or Internet capabilities. Two mentioned training needs for parents and teachers for online learning, and three mentioned teachers overloaded with the meeting needs of students. One mentioned trying to service life skills and special needs students online, and one mentioned teaching gifted students online and the difficulties that came with that.

**Major Suburban Part 2**. The most frequent codes were: (a) basic needs trumped learning and (b) homes were not learning environments. Half of the responses mentioned families concerned with meeting basic needs like making sure there was food and holding on to a job. One teacher said, “Families are more worried about how to pay their bills and where to get their next meal from, students are also worried about other factors than learning.”

Thirteen of the thirty responses mentioned that students were unsafe at home or were in an environment that was not conducive to learning. As one teacher put it, “Young elementary children are being left home unsupervised and are incapable of learning while parents are at work.” Another said, “Many students had to deal with a noisy and disruptive family structure while online learning. Example: little brother or sister walking by and talking/screaming, older siblings distracting them, parents watching TV. “

**Rural Part 1.** The most frequent codes were: (a) lack of devices or reliable Internet, (b) lack of parental support, and (c) parents unable to help/ need training on how to support online learning. Five of the 10 responses mentioned lack of technology devices or reliable Internet services was an issue in connecting students to online learning. As one teacher described it, “Many families had one device— often a phone—that had to be shared among several kids.”

Three mentioned lack of parental support in accessing online learning for students. Two mentioned that parents or guardians were not technology proficient enough to assist students in learning online. One teacher described parent issues as, “Lots of parents still had to work and students were cared for by other family members including older siblings.” Another teacher stated that, “serving students with special needs remotely was difficult.”

**Rural Part 2.** The most frequent codes were: (a) basic needs took priority, (b) parents unable to help/ older siblings helping too much or doing the work for them, and (c) lack of technology resources. Six of the 13 responses mentioned meeting basic needs quickly took priority over learning during the school shut-downs. As one teacher described how,“many families had difficulties getting basic supplies like food and toilet tissue. Therefore, school assignments were NOT a priority. Priority quickly becomes do you have the essentials for LIFE?”

Six respondents mentioned parent involvement of student learning, as described by the following comments, saying, “Students got very behind, even with recorded lessons because it seemed that the parents assisted way too much while at home and students did not retain much.”

Another said:

> Many families continued to work while their students stayed home, often alone or with older siblings to navigate the learning process. This was somewhat of a problem. In addition, many parents were unable to assist their students with the technology needed to be successful.

A third respondent stated that, “sometimes we find parents completing the work of the students. One of the biggest issues I saw was kids coming back but being so behind because they were not doing the work at home.”

Two mentioned lack of technology resources contributed to learning issues with students. One teacher said, “we need better Internet resources for our kids. It is very frustrating to try and teach when the kids don’t have the necessary things to complete their assignments.”

***Research Question Three***

Research question three asked, what are the differences between rural and major suburban elementary schools’ environmental dynamics?

A one-way ANOVA was conducted to determine whethere there was a difference in students’ schools’ environmental dynamics for schools with different school populations (major suburban and rural). There were two extreme data points for the major suburban group and one for the rural group, as assessed by boxplot; the assumption of homogeneity of variances was not violated, as assessed by Levene’s test for equality of variances ($p$ = .430) (see Table 20). Data was normally distributed for each group, as assessed by Shapiro-Wilk test ($p > .05$) (Table 21).

**Table 20**

*Research Question 3 Levene's Test of Homogeneity of Variances*

| | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|
| RQ3 | .630 | 1 | 62 | .430 |

**Table 21**

*Research Question 3 Shapiro-Wilk Test of Normality*

| | | Shapiro-Wilk | | |
|---|---|---|---|---|
| | Group | Statistic | df | Sig. |
| RQ3 | Major Suburban | .962 | 43 | .169 |
| | Rural | .961 | 21 | .528 |

Data is presented as mean ± standard deviation. The major suburban students' schools' environmental dynamics mean score of 43.88 with a standard deviation of 7.688 was higher than the rural students' schools' environmental dynamics mean score of 39.24 with a standard deviation of 7.688; see Table 22.

**Table 22**

*Research Question 3 Descriptive Statistics*

| Dependent Variable: RQ3 | | | |
|---|---|---|---|
| Group | Mean | Std. Deviation | N |

(continued)

| Group | Mean | Std. Deviation | N |
|---|---|---|---|
| Major Suburban | 43.88 | 7.688 | 43 |
| Rural | 39.24 | 8.955 | 21 |
| Total | 42.36 | 8.348 | 64 |

The difference between students' schools' environmental dynamics was statistically significantly different for different school populations, $F(1, 62) = 4.620$, $p = .036$ (see Table 23).

**Table 23**

*Research Question 3 ANOVA*

| RQ3 | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 304.506 | 1 | 304.506 | 4.620 | .036 |
| Within Groups | 4086.228 | 62 | 65.907 | | |
| Total | 4390.734 | 63 | | | |

Table 24 shows the item statements from the survey for research question one and the percentage of respondents that selected each rating (1=strongly disagrees, 2=disagrees, 3=somewhat disagrees, 4= neither agrees nor disagrees, 5= somewhat

agrees, 6= agrees, and 7=strongly agrees) from both the major suburban and rural school groups.

**Table 24**

*Research Question 3 Survey Item Response Rate Percentages*

| | | Percent Rating | | | | | | |
|---|---|---|---|---|---|---|---|---|
| During distance learning in the school | School Groups | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| My school provides platforms (Dojo, SeeSaw, Class Craft, Google Classroom, Edmodo, Canvas, Blackboard, Remind, etc…) for teachers and students to use for online learning. | Major Suburban | 0 | 0 | 0 | 0 | 12 | 40 | 49 |
| | Rural | 0 | 0 | 0 | 0 | 5 | 62 | 33 |
| My school has readily available technology help desk for any problems I encounter. | Major Suburban | 0 | 0 | 5 | 0 | 30 | 28 | 37 |
| | Rural | 5 | 19 | 14 | 0 | 29 | 24 | 10 |

(continued)

| | | Percent Rating | | | | | | |
|---|---|---|---|---|---|---|---|---|
| My school can supply Internet and/or computer devices for any student that does not have access to it at home. | Major Suburban | 0 | 2 | 0 | 5 | 16 | 51 | 26 |
| | Rural | 0 | 10 | 0 | 5 | 43 | 33 | 10 |
| I have access to technology needed to provide quality education to my students. | Major Suburban | 0 | 0 | 5 | 2 | 21 | 42 | 30 |
| | Rural | 5 | 10 | 5 | 0 | 10 | 52 | 19 |
| I have guidance and support on how to transition from in class learning to distance learning. | Major Suburban | 5 | 2 | 12 | 9 | 35 | 28 | 9 |
| | Rural | 5 | 19 | 10 | 5 | 29 | 29 | 5 |
| My school provided me with training on teaching in an online environment. | Major Suburban | 2 | 9 | 14 | 9 | 26 | 21 | 19 |
| | Rural | 5 | 24 | 10 | 5 | 29 | 14 | 14 |

(continued)

| | | Percent Rating | | | | | | |
|---|---|---|---|---|---|---|---|---|
| My school continually provided me with resources to support my transition to online teaching. | Major Suburban | 2 | 5 | 16 | 9 | 23 | 26 | 19 |
| | Rural | 5 | 14 | 19 | 10 | 24 | 19 | 10 |
| During distance learning in the school | School Groups | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| My school continually kept me informed of my responsibilities, and helped me to meet the needs of my students. | Major Suburban | 0 | 7 | 16 | 5 | 19 | 42 | 12 |
| | Rural | 5 | 0 | 5 | 10 | 43 | 29 | 10 |
| *Note:* 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neither agree nor disagree, 5 = somewhat agree, 6 = agree, and 7= strongly agree. | | | | | | | | |

Further investigation led to another one-way ANOVA to determine whether there was a difference in students' schools' environmental dynamics by the different grade levels represented (Pre-K through fifth grade). There were no extreme data points as assessed by boxplot; the assumption of homogeneity of variances was not violated, as assessed by Levene's test for equality of variances ($p$ = .032) (see Table 25).

**Table 25**

*Research Question 3 by Grade-Level Levene's Test of Homogeneity of Variances*

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| RQ3 | Based on Mean | 2.503 | 6 | 57 | .032 |

Even with this violation, Field (2018) contends that the parametric ANOVA is sufficiently robust that it can be withstood. Data was normally distributed for each group, (first grade only had two respondents so there was no data for this particular test) as assessed by Shapiro-Wilk test ($p > .05$) (Table 26).

**Table 26**

*Research Question 3 by Grade-Level Shapiro-Wilk Test of Normality*

| | | Shapiro-Wilk | | |
|---|---|---|---|---|
| | Grade Level | Statistic | df | Sig. |
| RQ3 | Pre-K | .964 | 4 | .806 |
| | Kinder | | | |
| | 1st | .977 | 10 | .948 |
| | 2nd | .891 | 8 | .237 |
| | 3rd | .948 | 12 | .607 |
| | 4th | .962 | 13 | .790 |
| | 5th | .982 | 15 | .981 |

Data is presented as mean ± standard deviation. The students' schools' environmental dynamics scores varied among the grade levels with Kinder and second being the lowest: pre-K ($M$ = 45.50, $SD$ = 8.583), Kinder ($M$ = 37.50, $SD$ = 14.849), first ($M$ = 46.70, $SD$ = 5.208), second ($M$ = 37.88, $SD$ = 5.693), third ($M$ = 41.17, $SD$ = 7.767), fourth ($M$ = 39.77, $SD$ = 11.692), and fifth ($M$ = 44.87, $SD$ = 6.209); see Table 27.

**Table 27**

*Research Question 3 by Grade-Level Descriptive Statistics*

| | N | Mean | Std. Deviation |
|---|---|---|---|
| Pre-K | 4 | 45.50 | 8.583 |
| Kinder | 2 | 37.50 | 14.849 |
| 1st | 10 | 46.70 | 5.208 |
| 2nd | 8 | 37.88 | 5.693 |
| 3rd | 12 | 41.17 | 7.767 |
| 4th | 13 | 39.77 | 11.692 |
| 5th | 15 | 44.87 | 6.209 |
| Total | 64 | 42.36 | 8.348 |

The difference between students' schools' environmental dynamics was not statistically significantly different for different grade levels, as $F(6, 63) = 1.605$, $p = .163$. See Table 28.

**Table 28**

*Research Question 3 by Grade-Level ANOVA*

| RQ3 | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 634.552 | 6 | 105.759 | 1.605 | .163 |
| Within Groups | 3756.183 | 57 | 65.898 | | |
| Total | 4390.734 | 63 | | | |

### *Qualitative Findings Regarding Schools' Environmental Dynamics*

After participants rated the eight survey items there was one open-ended items in which respondents had the option to answer. The open-ended response prompt was: "Every school is unique and things happened quickly. Schools are to be commended for doing so much with so little guidance. Knowing what you know now, what advice would you like to give or share for people who want to learn from this situation?"

**Major Suburban.** The most frequent codes were: (a) technology issues, (b) parental support issues, and (c) administrative planning. Of the 29 responses, two mentioned students needing more parental support. Four mentioned preparing for technology to fail or students not having the technology they needed. Seven mentioned that being patient and flexible were key to being successful. Four mentioned that training either provided by their school or found online helped them feel successful. Two

specifically stated that having plans and backup plans for when original plans did not work would be beneficial. Other significant comments were as follows:

> It is okay to not please everyone, it is okay to make mistakes, it is okay to not be perfect and have issues with technology. It is okay to not have the best and fanciest online platforms and virtual classrooms. You have to do what is best for your class and what is best for you as a teacher. Do not overwork and burn yourself out trying to have the best online classroom.

Another teacher offered this advice regarding technology:

> Breathe and expect for technology to fail. Have a backup plan and a backup plan for the backup plan when things go wrong with technology. Know that parents are frustrated and they may take it out on you, but also appreciate the parents who realize that everyone is stressed and they actually thank you many times over.

Another respondent pointed out the value of colleagues, saying, "Collaborating with other teachers really helped divide the workload."

One teacher spoke of the importance of patience and flexibility:

> We have to remember at the end of the day, children are resilient. They also watch everything we do. How we handle situations such as a shutdown, exemplifies for them how they too can handle similar situations in the future.

Another teacher talked about:

> Teachers need back up. There was so much pressure on them to continue doing their job as if there was no pandemic. Parents and students received

> grace, as they should, but so should teachers. It's hard to do what's best for your students when the expectations aren't adjusted to fit the situation. So, adjust the expectations and increase the support so that everyone, students, parents and teachers, can be as successful as possible in the middle of so much uncertainty.

**Rural.** The most frequent codes were: (a) technology, (b) flexibility, and (c) planning. Four of the fourteen responses mentioned being open-minded and flexible to change will allow for student and teacher success. One teacher said, "It's a learning curve. It's one day at a time. It changed hourly and many were just trying to provide for their families. It's hard to get mad or upset when survival was at the foremost of most families' mind."

Four respondents mentioned technology resources being limited and said that if there had been more and if the students had been trained prior to going virtual, things would have run more smoothly. One teacher mentioned training parents in technology use would be beneficial. Other significant comments were:

> Once basic life necessities are ensured, kids need to have that balance that YES, we are still going to be learning and growing with each other. A schedule should be made so that their interaction with the world is not completely severed, and some semblance of normalcy can come into their lives.

Another teacher had this reminder: "Keep an open mind no matter how long you have been in the teaching field." And finally, one teacher remarked that:

> There is no one size fits all in regards to remote or distance learning. Every community, school and household face different challenges. For this reason,

remote/distance learning is and will always be a challenge to educators as well as students.

## Research Hypothesis

### *Hypothesis 1*

It was hypothesized that the rural schools would have lower levels of community environmental dynamics than the major suburban elementary schools during the distance learning COVID-19 crisis. Regarding the extent to which differences might be present in the community environmental dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 28.61) = 15.36$, $p = .001$ with a large effect size (Gall et al., 2007).

### *Hypothesis 2*

It was hypothesized that the rural schools would have lower levels of home environmental dynamics than the major suburban elementary schools during the distance learning COVID-19 crisis. Regarding the extent to which differences might be present in the home environmental dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 62) = 24.024$, $p < .001$ with a large effect size (Gall et al., 2007).

### *Hypothesis 3*

It is hypothesized that the rural schools will have lower levels of school environmental dynamics than the major suburban elementary schools during the distance learning COVID-19 crisis. Regarding the extent to which differences might be present in the school dynamics of rural and major suburban elementary school students', the

parametric ANOVA revealed a statistically significant difference, $F(1, 62) = 4.620$, $p = .036$ with a large effect size (Gall et al., 2007).

**Summary of Results**

The purpose of this research was to examine the differences in the environmental dynamics that affect distance learning among rural and major suburban elementary schools during the COVID-19 crisis. Results from a teacher survey with 24 Likert-like items and four open response items have been presented in response to the three research questions. Regarding the extent to which differences might be present in the community environmental dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 28.61) = 15.36$, $p = .001$, with a large effect size (Gall et al., 2007). Regarding the extent to which differences might be present in the home environmental dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 62) = 24.024$, $p < .001$, with a large effect size (Gall et al., 2007). Regarding the extent to which differences might be present in the school dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 62) = 4.620$, $p = .036$, with a large effect size (Gall et al., 2007).

# CHAPTER V

## Discussion, Implications, and Recommendations

### Introduction

The purpose of this mixed methods study was to examine the differences in the environmental dynamics that affected distance learning among rural and major suburban elementary schools during the COVID-19 crisis. This chapter includes a discussion of major findings as related to the literature on social cognitive theory and distance learning in elementary education and what implications may be valuable for use by educational leaders. This chapter concludes with a discussion of the limitations of the study, areas for future research, a brief summary, and discussion of the research questions:

1. What are the differences between rural and major suburban elementary school students' community environmental dynamics?
2. What are the differences between rural and major suburban elementary school students' home environmental dynamics?
3. What are the differences between rural and major suburban elementary schools' environmental dynamics?

The rapidly spreading nature of COVID-19 caused the closure of many educational institutions. Some schools utilized distance learning during the quarantine period to help students continue in their education. Social cognitive theory emphasizes the importance of environment and its effect on behavior. Due to COVID-19, the environment of students and teachers shifted drastically and at an alarming pace. Schools were no longer operating with students in classes. Students were logging into devices (some for the first time) to interact with their teachers to try and learn their content, while

others without access to technology were left with packets and books to learn with at home. This study explored the impact of these environmental dynamics on learning during the COVID-19 school closures.

**Discussion**

The first eight items on the survey related to students' community environmental dynamics. The major suburban elementary students' community environmental dynamics mean score of 44.09 and a standard deviation of 6.98 was higher than the rural elementary students' community environmental dynamics mean score of 34.05 with a standard deviation of 10.68. Regarding the extent to which differences might be present in the community environmental dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 28.61) = 15.36$, $p = .001$ with a large effect size (Gall et al., 2007). When analyzed by grade level, there was no significant difference between the mean scores.

The open-ended response item for this section was: "Is there anything unique about how your community handled learning and meeting the needs of students during the schools being shut down due to COVID-19 that you feel would be important for others to know?" The major suburban teacher comments focused on technology issues that ranged from not having the right technology, not having reliable Internet access, or not having someone to help with technology use for learning at home to not being trained on how to teach with different platforms in distance learning. The rural teacher comments focused more on student access to technology being limited and families requesting paper packets due to limited technology or Internet access for online learning.

The next eight items related to students' home environmental dynamics. Regarding the extent to which differences might be present in the home environmental dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 62) = 24.024$, $p < .001$ with a large effect size (Gall et al., 2007). When analyzed by grade level, there were no major distinctions between mean scores to report. There were two open-ended response items on this section of the survey. Part one asked, "What needs were unique to your students' families that may not have been mentioned above that you feel would be important for others to learn from?" Fourteen of the 28 major suburban responses mentioned students having trouble with technology and not having parents home during the day to help. These also mentioned students having to help siblings because parents are working so they are not only had to do their school but also take care of younger siblings as well.

Eighteen of the responses mentioned students needing support of some kind in getting online to do the work, or in getting the work turned in. Lack of support for on-line learning was a common theme among comments from the major suburban group. For the rural group, common themes were lack of technology devices or reliable Internet for connecting to online learning. Some students had to share one device with multiple siblings during the time they were supposed to all be online for learning, which caused some issues in not being able to be in class when they were supposed to be in class. Part two asked: "Are there any concerns you have about families during school shut-down situations that you would like to share?" Half of the 30 major suburban responses mentioned families were concerned with meeting basic needs like making sure there was food and holding on to a job. These families were worried about jobs, and money to pay

bills, which in turn affected the students and their ability to focus on learning when other stressors were present. Thirteen of the 30 responses mentioned students were unsafe at home or were in an environment that was not conducive to learning. Many of the students were left alone while parents had to work, or they were left to supervise younger siblings, which impacted their ability to complete online learning. Six of the 13 rural responses mentioned that meeting basic needs quickly took priority over learning during the school shut-downs.

The last section of the survey looked at the environmental dynamics of the school. Regarding the extent to which differences might be present in the community environmental dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 28.61) = 15.36$, $p = .001$ with a large effect size (Gall et al., 2007). When analyzed by grade level there was no significant difference to report. The last open-ended item to respond to was: "Every school is unique and things happened quickly. Schools are to be commended for doing so much with so little guidance. Knowing what you know now, what advice would you like to give or share for people who want to learn from this situation?"

The most commonly recurring comment of the major suburban group was that students needed more parental support to be successful in online learning. Some mentioned preparing for technology to fail or knowing students would not have technology needed and to make alternative plans for those situations would help to make things run smoother. Seven mentioned being patient and flexible was key to being successful. Four mentioned training either provided by their school or found online

helped them feel successful. Two specifically mentioned having plans and backup plans for when original plans did not work would be beneficial.

Through all the survey items and open-ended response items, what came across from both major suburban and rural schools was that teachers were working to meet the needs of the students however they could, either through paper packets, or providing technology if their school had the option, and the student had Internet service available, and students were faced with many challenges that were beyond their control that impacted the education they received during this time.

**Connection to the Literature**

Two central concepts emerged as barriers to distance learning during the COVID-19 crisis: (1) technology availability and dependability and (2) environmental influences beyond student control. According to Smith (2016), digital equity is a complex issue that reflects other inequities: socioeconomic concerns and inequalities of types of devices and Internet connections. Passey et al. (2018) commented how research on young people's technology use suggests that their abilities to access digital technologies remain patterned strongly along lines of socioeconomic status and social class. Hohlfeld (2017) suggests that socioeconomic differences are the primary determinant of inequality, because of unequal distribution of economic resources, lack of opportunities to build human capital, and unavailable social resources. Overall spending for educational technology in American schools has exceeded $630 billion, which comes out to approximately $12,608 per student (Herold, 2016). According to Kormos (2018), public schools in rural and urban areas are as unique and diversified as the communities they educate.

The disparity in funding among school districts has led to a "digital divide" among students. The digital divide describes the inequality in access to technology that exists between communities due to regional and demographic differences. Although major suburban schools rated community and home environmental dynamics higher than rural schools, the school environmental dynamics were roughly the same, and when the open-ended response items were coded and analyzed, the most frequently used code was technology. Teachers from both types of schools mentioned schools providing technology when they could but at the same time mentioned not having enough technology, or students not having the support needed to use it properly for distance learning. Barriers are also mentioned in the literature by Saxena (2017) and Tondeur et al. (2017). Barriers extrinsic to the educator and student, such as Internet access, sufficient bandwidth, and access to technology hardware have been lowered in the United States (Saxena, 2017). However, barriers such as attitudes, beliefs, and practices that are intrinsic to the educator are still persistent. These are influenced not only by personal attitudes, but also by social contexts, cultural landscapes, and learned pedagogical practices (Saxena, 2017; Tondeur et al., 2017).

The difference between environmental dynamics of major suburban and rural school students' home and community impacts on distance learning is similar to that of Kormos' (2018) report that rural schools struggle more with limitations brought upon by slow bandwidth than urban and suburban schools. Slower Internet speeds may limit a teacher's access to instructional materials such as images, videos, and document downloads (Kormos, 2018). In Kormos' study of a mid-Atlantic state, K–12 public school teachers' access to technology, frequency of use, and perceived effectiveness,

found that the mean score for urban teachers was higher than rural and teachers when considering teacher satisfaction with access to technology. When considering web-based communication tools, urban teachers reported the lowest average frequency of use, while rural teachers were most likely to use the technology on a daily basis. Although each group had similar mean scores, urban teachers had a higher standard deviation.

**Relationship to Theoretical Framework**

The social cognitive theory originated by Albert Bandura (1977, 1986) emphasizes that learning occurs under social pretenses, and the same applies to technology-based learning. The primary assumption is the impression that personal, behavioral, and environmental dynamics have an interrelationship, affecting one another in a mutual approach to learning. Bandura (2001) suggests that this relationship has a substantial impact on an individual's operation as result of the interaction between cognitive, behavioral, and contextual factors. Therefore, the academic environment shapes classroom learning through the reinforcement of factors that influence learners and their communities. Also associated with social cognitive theory is the importance of environment and its effect on behavior.

Due to COVID-19, the environment shifted drastically and at an alarming pace. Schools were no longer operating with students in classes. Students were logging into devices (some for the first time) to interact with their teachers to try and learn their content, while others without access to technology were left with packets and books to learn with at home.

This study explored these environmental dynamics and their impact on learning during the COVID-19 school closures. While the parametric ANOVAs revealed that the

extent to which differences might be present were statistically significant for all three research questions, what may be a bit more beneficial to educational leaders is the responses to the open-ended questions. This is where the teachers specifically said what those barriers were. As Santarossa et al. (2018) explain, human interaction is the major influence in social and behavioral change.

In this study, teachers from both types of schools explained how students were mostly left at home alone during this time without adult supervision to help with learning. Some parents were working either at home or away from home and leaving their children to do schoolwork alone. Some households did not provide supervision of online learning but left it up to the student, and they did not ensure that there was a distraction-free place for the student to do their work. Students were left to access their classes online by themselves if they could, and according to other responses many were also responsible for helping younger siblings do their classwork as well. Human interaction suffered as parents struggled to keep jobs, as mentioned in several responses to other open-ended statements, and the priority became survival and education was put to the side during this time. Parents were struggling to make sure their families had enough food, toilet tissue, and basic needs and to hold on to their jobs, which affected the students' learning.

Many teachers mentioned the lack of a planning and how things changed hour by hour. Teachers struggling with a lack of schedule reflected on the students and then the students also struggled with the lack of schedule, as Kim and Park (2018) mentioned in their study on social cognitive theory on key factors influencing an individual's behavior to use e-learning. What they found was that the primary challenges both students and faculty faced in adopting e-learning, were primarily user beliefs, computer access,

software, and support. They also noted it was important to look at the user's (student or faculty) self-belief in their ability to be successful in the on-line environment. Their research found that self-efficacy is a critical factor affecting individual performance, technology acceptance, and actual use of technology (Kim & Park, 2018).

Human interaction changed within a week's notice. Students were no longer attending school where they had been spending eight hours a day, five days a week, for the past seven months. They were now forced to stay at home, sometimes with family members, and sometimes alone while parents worked. School was delivered over the Internet and through a device, or by a paper packet dropped off or picked up from the school. There was no more interaction with teachers or friends face-to-face. Parents were stressed about work, money, bills, and providing for the family, let alone making sure their child's education continued. Students were living in an era no one had ever experienced before. Stressors beyond students' control interfered with their distance learning, and they were navigating learning in a way many students had not experienced before during COVID-19. This is a challenge educators can continue to learn from.

**Implications**

This study centered on major suburban and rural elementary schools in Texas during the COVID-19 quarantine period where in-person learning was not an option, and these schools were challenged with transitioning to online learning within a matter of days. Teachers voluntarily answered the survey about environmental dynamics that impacted the implementation of distance learning. Three areas of consideration materialized: (1) access and reliability of Internet and technology devices for learning at

home, whether the student or school provided it, (2) parental support if it was available, and capable for learning at home, and (3) teacher training and support for online learning.

When asked if Internet is reliable on a regular basis in all areas of their school zone, 14 percent of major suburban teachers either somewhat disagreed or disagreed while 62 percent of rural teachers strongly disagreed, somewhat disagreed or disagreed, showing that the rural schools struggled with Internet reliability in their communities more than the major suburban schools. If community members could get together to provide hot-spot zones where students could access the Internet, more students would have places where they could log into their classes and access their material for learning online. Some schools took their buses and set up hot spots on routes where Internet was not reliable during the school day so students could sit in their yards and have Internet access. Community members should be encouraged to collaborate to find solutions to help their school-aged community members have reliable Internet during the school day for learning purposes.

When asked if all students had access to technology to access learning online at home, 70 percent of major suburban teachers somewhat agreed, agreed, or strongly agreed, where 14 percent of rural teachers somewhat agreed, agreed, or strongly agreed. However, when asked if their school could supply Internet and/or computer devices for any student who did not have access to it at home, 93 percent of major suburban teachers somewhat agreed, agreed, or strongly agreed, and 86 percent of rural teachers somewhat agreed, agreed, or strongly agreed. This shows that even though the rural students may not have it at home, the schools did have the ability to provide it. In May of 2020 the Texas Education Agency (2021) provided funds through the CARES Act to schools to

purchase educational technology for students to use while at home during this quarantine period. With some schools, it was up to the parents to check out those devices, while other schools utilized the bus routes and delivered the devices to the students' homes. School leaders should research grants and find innovative ways to get technology devices and hotspots if necessary into the hands of students so that lack of Internet or a device to access the Internet with is not an issue.

When asked if parents can help students navigate learning online and provide support when needed, 59 percent of major suburban school teachers strongly agreed, agreed, or somewhat agreed, while 71 percent of rural teachers strongly disagreed, disagreed, or somewhat disagreed, showing that the rural school teachers believed that parental support of online learning at home is problematic. Rural schools need to determine if the problem lies in the availability of the parent or the ability of the parent. There are many parent-training videos available for online learning that schools can access and send to parents to help support them with their students. When parents feel that they are capable of helping their student or know specifically what to do to help, they are more likely to step in and help when needed. Many teachers responded to some of the open-ended statements with recommendations about keeping lines of communication with parents open and reaching out to them to offer support as much as possible to increase student engagement and success. School leaders need to assess parent needs and find innovative ways to incorporate parent trainings or help sessions so that parents know specifically how to help their children be more successful, especially during uncertain times.

Finally, the last area of consideration is teacher training and support. When asked whether their school provided them with training on teaching in an online environment, 65 percent of major suburban and 57 percent of rural teachers strongly agreed, agreed, or somewhat agreed. When asked whether their school continually provided them with resources to support the transition to online teaching, 67 percent of major suburban and 52 percent of rural teachers strongly agreed, agreed, or somewhat agreed. The school leaders are providing training and resources that they have, but this is a novel situation for a novel virus. Leaders know about online learning, but not during a pandemic when students' environments were considerably shifted from one extreme to the other within a matter of days. School administration needs to plan for and train teachers in ways teachers can address natural disasters or other reasons why schools may be forced into online learning-only again so that students' social emotional needs can be addressed and learning can occur. Innovative planning and training of teachers by district administration will enable teachers to be successful in implementing online learning and in the end help their students to be successful in learning online.

**Recommendations for Future Research**

As suggested by Talaee and Noroozi (2019), digging deeper into parental encouragement, attitude, support and engagement in using home computers/Internet for educational purposes would shed light onto the environmental dynamic of environmental influences on learning behaviors. Including this in a survey and then including parents, students, administrators, and other educational stake holders as additional participants in the survey, with a greater number of participants, would yield more in-depth results. The survey would need to be revised to include statements pertaining to current situations.

Utilizing TEA's classification system, schools would be selected and then contacted for permission to participate. Extending the time frame to a semester (August – December) would allow for greater participation and allow for follow-up reminders.

**Conclusions**

Regarding the extent to which differences might be present in the community environmental dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 28.61) = 15.36$, $p = .001$, with a large effect size (Gall et al., 2007). Regarding the extent to which differences might be present in the home environmental dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 62) = 24.024$, $p < .001$, with a large effect size (Gall et al., 2007). Regarding the extent to which differences might be present in the school dynamics of rural and major suburban elementary school students', the parametric ANOVA revealed a statistically significant difference, $F(1, 62) = 4.620$, $p = .036$, with a large effect size (Gall et al., 2007).

When the open-ended items were evaluated three central themes emerged: (1) technology availability and dependability, (2) parental support availability and capability, and finally, (3) teacher training and support. Schools were asked to shift gears at a moments' notice and rethink teaching and learning. The study highlighted the importance of understanding that the situation is new to everyone, making sure everyone is informed as much as possible, and knowing that there are no one-size-fits-all plan in this situation. Every school, community, and home will face different challenges. Patience and understanding will be key to success in the future.

## REFERENCES

Ally, M. (2019). Competency profile of the digital and online teacher in future education. *International Review of Research in Open and Distributed Learning*, *20*(2), 302–318.

Aman, T. M. (2018). *The geographic achievement gap: A quantitative investigation into academic success in rural and non-rural public high schools in North Carolina* [Unpublished doctoral dissertation]. North Carolina State University.

Bakir, I. (2015, September). *Throwing money at education technology isn't the answer [opinion]*. https://www.noodle.com/articles/why-are-schoolswasting-so-much-money-on-ed-tech-2015-09-23

Bao, Z., & Han, Z. (2019). What drives users' participation in online social Q&A communities? An empirical study based on social cognitive theory. *Aslib Journal of Information Management*, *71*(5), 637–656. https://doi.org/10.1108/AJIM-01-2019-0002

Barrett, J. A. (2013). *Elementary school computer access, socioeconomic status, ethnicity, and grade 5 student achievement*. [Unpublished doctoral dissertation.] Sam Houston State University.

Barrett, J., Moore, G., & Slate, J. (2014). Elementary students in Texas: Inequitable access to computers. *Journal of Education Research*, *8*(3), 107–121.

Bednar, A. K., Cunningham, D. J., Duffy, T. M., & Perry, J. D. (1992). Theory into practice: How do we link? In T. M. Duffy & D. H. Jonassen (Eds.), *Constructivism and the technology of instruction* (pp. 17–34). Lawrence Erlbaum Associates.

Belotto, M. J. (2018). Data analysis methods for qualitative research: Managing the challenges of coding, interrater reliability, and thematic analysis. *Revista Brasileira de Enfermagem*, *71*, 2622–2633.

Bevans, R. (2020, July 17). *Two-way ANOVA: When and how to use it, with examples.* Scribbr. https://www.scribbr.com/statistics/two-way-anova/

Bill & Melinda Gates Foundation. (2015). *Teachers know best: What educators want from digital instructional tools 2.0*. https://s3.amazonaws.com/edtech-production/reports/Teachers-Know-Best-2.0.pdf

Bloomfield, J., & Fisher, M. J. (2019). Quantitative research design. *Journal of the Australasian Rehabilitation Nurses' Association (JARNA)*, *22*(2), 27–30. https://doi.org/10.33235/jarna.22.2.27-30

Bonner, W. H. (2017). *A comparison of academic performance and financial disparity at Texas charter schools and traditional public schools* [Unpublished doctoral dissertation]. Dallas Baptist University.

Borup, J., & Evmenova, A. S. (2019). The effectiveness of professional development in overcoming obstacles to effective online instruction in a college of education. *Online Learning*, *23*(2), 1–20.

Briggs, D. (2020). Coronavirus (COVID-19). *Asia Pacific Journal of Health Management*, *15*(1), 2. https://doi.org/10.24083/apjhm.v15i1.371

Bruner, J. S. (1961). The act of discovery. *Harvard Educational Review*, *31*(1), 21–32.

Buczynski, S., & Mathews, K. (2016). An urban school district's 21st century teaching vision: Integration and readiness to incorporate technology. *Annual International*

*Conference on Education & E-Learning*, 34–49. https://doi.org/10.5176/2251-1814_EeL16.12

Carpenter, J. (2020, November 20). Houston-area schools see surge in failing students as COVID wreaks havoc on grades. *Houston Chronicle.* https://www.houstonchronicle.com/news/houston-texas/education/article/houston-schools-fail-grades-surge-class-15743142.php

Cinteza, M. (2020). COVID 19. A flash in mid-March. *Maedica - a Journal of Clinical Medicine*, *15*(1), 3–5. https://doi.org/10.26574/maedica.2020.15.1.3

Centers for Disease Control and Prevention (2020, April 22). *Coronavirus (COVID-19) frequently asked questions.* Retrieved April 30, 2020, from https://www.cdc.gov/coronavirus/2019-ncov/faq.html#Coronavirus-Disease-2019-Basics

Centers for Disease Control and Prevention (2020). *School Settings.* Retrieved September 08, 2020, from https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/index.html

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE.

D'Aprile, V. (2017). *Let's get digital: Teachers' perspectives and practices of effective technology integration* [Master's thesis]. University of Toronto. https://tspace.library.utoronto.ca/bitstream/1807/76978/1/DAprile_Veronica_201706_MT_MTRP.pdf

Davis, D. D. (2018). *Educational technology commercialization, use, and adoption in public K-12 schools* [Dissertation]. New Jersey City University.

Dewey, J. (1929). *The quest for certainty.* Minton.

Deye, S. (2015). Harnessing the power of technology in the classroom. *National Conference of State Legislatures.* Washington D.C. www.ncsl.org/Portals/1/Documents/educ/technology_final.pdf

Dolan, J. (2017). Withering opportunity: Technology implementation in K-12 schools, the opportunity gap and the evolving digital divide. *Journal of Current Issues in Media & Telecommunications*, *9*(1), 15–37.

Durff, L., & Carter, M. (2019). Overcoming second-order barriers to technology integration in K–5 Schools. *Journal of Educational Research & Practice*, *9*(1), 246–260.

Debroy, A. (2017, December 9). *Countries which are leading the way in online education.* EdTechReview. https://edtechreview.in/e-learning/3028-countries-leading-in-online-education

Evergreen Group. (2017). *Keeping pace with K–12 online learning: 2016*. https://static1.squarespace.com/static/59381b9a17bffc68bf625df4/t/593efc779f745684e6ccf4d8/1497300100709/EEG_KP2016-web.pdf

Field, A. P. (2018). *Discovering statistics using IBM SPSS statistics*. Sage Publications.

Flynn, S. V., & Korcuska, J. S. (2018). Credible phenomenological research: A mixed-methods study. *Counselor Education & Supervision*, *57*(1), 34–50.

Ford, E. (2020). Tell me your story: Narrative inquiry in LIS research. *College & Research Libraries*, *81*(2), 235–247. https://doi.org/10.5860/crl.81.2.235

Francom, G. M. (2016). Barriers to technology use in large and small school districts. *Journal of Information Technology Education: Research*, *15*, 577–591.

Freidhoff, J. R. (2015). *Michigan's K–12 virtual learning effectiveness report 2013–14.* Michigan Virtual University. https://michiganvirtual.org/research/publications/michigans-k-12-virtual-learning-effectiveness-report-2013-14/

Gall, M.D., Gall, J.P., & Borg, W.R. (2007) *Educational Research.* (8th ed.) Pearson Education, Inc.

Goldchain, M. (2019, February 19). Rural students' technology access still lagging behind, ACT report shows. *Education Week*. [blog]. http://blogs.edweek.org/edweek/DigitalEducation/2019/02/act-rural-digital-divide.html

Graves, K. E., & Bowers, A. J. (2018). Toward a typology of technology-using teachers in the "New Digital Divide": A latent class analysis of the NCES fast response survey system teachers' use of educational technology in U.S. public schools, 2009 (FRSS 95). *Teachers College Record*, *120*(8), 1–42.

Hamlin, J. B., & Leslie, H. (2019). Old dogs and new tricks: Facilitating implementation of contemporary academic technology with an aging teaching population. *Journal of Higher Education Theory & Practice*, *19*(8), 10–16.

Headley, M. G., & Plano Clark, V. L. (2020). Multilevel mixed methods research designs: Advancing a refined definition. *Journal of Mixed Methods Research*, *14*(2), 145–163.

Herold, B. (2016, July 5). Teachers in high-poverty schools less confident in ed-tech skills. *EdWeek Market Brief* [online].

https://marketbrief.edweek.org/marketplacek-12/teachers-in-high-poverty-schools-less-confident-in-ed-tech-skills-survey-finds/

Hildebrandt, K., & Couros, A. (2017, September 17). Social justice in a post-truth world. *Education Canada*, *57*(3), 13–14. https://www.edcan.ca/articles/social-justice-post-truth-world/

Hohlfeld, T. N., Ritzhaupt, A. D., Dawson, K., & Wilson, M. L. (2017). An examination of seven years of technology integration in Florida schools: Through the lens of the levels of digital divide in schools. *Computers & Education*, *113*, 135–161. https://doi.org/10.1016/j.compedu.2017.05.017

Howell, K. W. (2004). Texas school laws and public education in east Texas: The beginnings of public schools in Henderson County, Texas, 1854–1868. *East Texas Historical Journal*, *42*(2), 25–37.

Igberadja, S. (2017). Factors affecting quality implementation of basic technology curriculum in secondary schools in Nigeria. *International Journal of Vocational Education & Training*, *24*(2), 17–27.

Johnson, R. B., & Christensen, L. (2012). *Educational research: Quantitative, qualitative, and mixed approaches* (4th ed.). Sage.

Kim, B., & Park, M. J. (2018). Effect of personal factors to use ICTs on e-learning adoption: Comparison between learner and instructor in developing countries. *Information Technology for Development*, *24*(4), 706. https://doi.org/10.1080/02681102.2017.1312244

Kinchen, M. W. (2015). *Administrator perceptions of technology effectiveness and adequacy in curriculum and instruction in traditional and one to one computing public schools.* [Unpublished doctoral dissertation.] Mississippi College.

Kormos, E. M. (2018). The unseen digital divide: Urban, suburban, and rural teacher use and perceptions of web-based classroom technologies. *Computers in the Schools*, *35*(1), 19–31. https://doi.org/10.1080/07380569.2018.1429168

Kruger-Ross, M. (2018). Reclaiming our assumptions at the intersection of technology, learning and equity. *Texas Education Review*, *6*(1), 39–46. https://doi.org/10.15781/T2MK65S1N

Kuyatt, A., Holland, G., & Jones, D. (2015). An analysis of teacher effectiveness related to technology implementation in Texas secondary schools. *Contemporary Issues in Education Research*, *8*(1), 63–70. https://doi.org/10.19030/cier.v8i1.9091

Lachner, A., Backfisch, I., & Stürmer, K. (2019). A test-based approach of modeling and measuring technological pedagogical knowledge. *Computers & Education*, *142*. https://doi.org/10.1016/j.compedu.2019.10364

LaGow, R. (2019, February 21). *E-rate.* Texas Education Agency. https://tea.texas.gov/Academics/Learning_Support_and_Programs/Technology_Planning/E-rate/

Lee, C. H., & Soep, E. (2016). None but ourselves can free our minds: Critical computational literacy as a pedagogy of resistance. *Equity & Excellence in Education*, *49*(4), https://doi.org/480. 10.1080/10665684.2016.1227157

Liu, F., Ritzhaupt, A., Dawson, K., & Barron, A. (2017). Explaining technology integration in K-12 classrooms: a multilevel path analysis model. *Educational*

*Technology Research & Development*, *65*(4), 795–813. https://doi.org/10.1007/s11423-016-9487-9

Madurai Elavarasan, R., & Pugazhendhi, R. (2020). Restructured society and environment: A review on potential technological strategies to control the COVID-19 pandemic. *Science of the Total Environment*. https://doi.org/10.1016/j.scitotenv.2020.138858

Mccandless, J. (2015, May). *U.S. education institutions spend $6.6 billion on IT in 2015 resources like tablets, notebooks and learning apps are more relevant to students than ever before, and they have a huge place in the world of education.* Center for Digital Education. http://www.centerdigitaled.com/higher-ed/US-Education-Institutions-Spend-66-Billion-on-IT-in-2015.html

Merriam-Webster. (n.d.). *Implementation*. Retrieved April 27, 2020, from https://www.merriam-webster.com/dictionary/implementation

Middleton, L., Hall, H., & Raeside, R. (2019). Applications and applicability of social cognitive theory in information science research. *Journal of Librarianship and Information Science*, *51*(4), 927–937. https://doi.org/10.1177/0961000618769985

Montgomery, M. C. (2017). *Factors that influence technology integration in the classroom* [Doctoral dissertation]. University of Maryland. https://drum.lib.umd.edu/bitstream/handle/1903/19411/Montgomery_umd_0117E_17917.pdf?sequence=1&isAllowed=y

Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *IOSR Journal of Research & Method in Education*, *5*(6), 66–70. https://doi.org/10.9790/7388-05616670

Onwuegbuzie, A. J., & Daniel, L. G. (2002). Uses and misuses of the correlation coefficient. *Research in the Schools, 9*(1)*,* 73–90.

Papendieck, A. (2018). Technology for equity and social justice in education: A critical issue overview. *Texas Education Review*, *6*(1), 1–9. https://doi.org/10.15781/T2891278V

Passey, D., Shonfeld, M., Appleby, L., Judge, M., Saito, T., & Smits, A. (2018). Digital agency: Empowering equity in and through education. *Technology, Knowledge and Learning*, *23*(3), 425–439. https://doi.org/10.1007/s10758-018-9384-x

Philip, T. M., & Olivares-Pasillas, M. C. (2016). Learning technologies and educational equity: Charting alternatives to the troubling pattern of big promises with dismal results. *Teachers College Record*. https://www.tcrecord.org/Content.asp?ContentId=21616

Piaget, J. (1980). The psychogenesis of knowledge and its epistemological significance. In M. Piatelli-Palmarini (Ed.), *Language and learning* (pp. 23–34). Harvard University Press.

Piccioli, M. (2019). Educational research and mixed methods. research designs, application perspectives, and food for thought. *Studi Sulla Formazione*, *22*(2), 423–438. https://doi.org/10.13128/ssf-10815

Plyler, C. M. (2017). *A mixed methods study of superintendents' influence and technology integration in K–12 Texas public school districts* (Publication No. 2022344921). [Doctoral dissertation, Texas A&M University – Commerce. ProQuest Dissertations & Theses Global.

Pulham, E., & Graham, C.R. (2018). Comparing K-12 online and blended teaching competencies: A literature review. *Distance Education*, *39*(3), 411–432.

Rice, M. (2017). Few and far between: Describing K-12 online teachers' online professional development opportunities for students with disabilities. *Online Learning*, *21*(4), 103–121.

Rice, M. F., & Deschaine, M. E. (2020). Orienting toward teacher education for online environments for all students. *Educational Forum*, *2*, 114–125.

Robinson, L. R., Holbrook, J. R., Bitsko, R. H., Hartwig, S. A., Kaminski, J. W., Ghandour, R. M., Peacock, G., Heggs, A., & Boyle, C. A. (2017). Differences in health care, family, and community factors associated with mental, behavioral, and developmental disorders among children aged 2–8 years in rural and urban areas—United States, 2011–2012. *Morbidity and Mortality Weekly Report Surveillance Summaries,* 66(8): 1–11. http://dx.doi.org/10.15585/mmwr.ss6608a1

Sahin, M. D., & Öztürk, G. (2019). Mixed method research: Theoretical foundations, designs and its use in educational research. *International Journal of Contemporary Educational Research*, *6*(2), 301–310.

Santarossa, S., Kane, D., Senn, C., & Woodruff, S. J. (2018). Exploring the role of in-person components for online health behavior change interventions: Can a digital person-to-person component suffice? *Journal of Medical Internet Research*, *20*(4), 1. https://doi.org/10.2196/jmir.8480

Saxena, A. (2017). Issues and impediments faced by Canadian teachers while integrating ICT in pedagogical practice. *The Turkish Online Journal of Educational Technology, 16*, 58–70.

Schaffhauser, D. (2016, January 19). *Report: Education tech spending on the rise.* The Journal. https://thejournal.com/articles/2016/01/19/report-education-tech-spending-on-therise

Schoonenboom, J. & Johnson, R.B. (2017). How to construct a mixed methods research design. *Köln Z Soziol 69,* 107–131. https://doi.org/10.1007/s11577-017-0454-1

Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology*, *60*. https://doi.org/10.1016/j.cedpsych.2019.101832

Sheninger, E. C. (2016). *Uncommon learning: Creating schools that work for kids.* SAGE Publications.

Sherin, A. (2020). Coronavirus disease 2019 (COVID-19): A challenge of protecting the general population and healthcare workers. *Khyber Medical University Journal, 12*(1), 4–5. https://doi.org/10.35845/kmuj.2020.20224

Showalter, D., Klein, R., Johnson, J., & Hartman, S. L. (2017). Why rural matters 2015–2016: Understanding the changing landscape. *The Rural School and Community Trust.* http://www.ruraledu. org/user_uploads/file/WRM-2015-16.pdf.

Sims, C. (2017). *Disruptive fixation: School reform and the pitfalls of techno-idealism*. Princeton University Press.

Slate, J. R., & Rojas-LeBouef, A. (2011). *Calculating basic statistical procedures in SPSS: A self-help and practical guide to preparing theses, dissertations, and manuscripts.* NCPEA Press.

Smith, R. (2017, June 25). *ISTE releases new standards for educators to maximize learning for all students using technology*. ISTE. https://www.iste.org/explore/Press-Releases/ISTE-Releases-New-Standards-for-Educators-to-Maximize-Learning-for-All-Students-Using-Technology

Smith, T. (2016). Digital equity: "A moral imperative": Part 3. *Technology & Learning*, (11), 50.

Smith, K. N., Lamb, K. N., & Henson, R. K. (2020). Making meaning out of MANOVA: The need for multivariate post hoc testing in gifted education research. *Gifted Child Quarterly*, *1*, 41.

Talaee, E. & Noroozi, O. (2019). Re-Conceptualization of "Digital Divide" among primary school children in an era of saturated access to technology. *International Electronic Journal of Elementary Education*, *12*(1), 27–35. https://doi-org.ezproxy.shsu.edu/10.26822/iejee.2019155334

Texas Education Agency. (2021). *COVID-19 and federal grant funds*. Retrieved on: February 19, 2021. from https://tea.texas.gov/finance-and-grants/grants/covid-19-and-federal-grant-funds

Texas Education Agency. (2019). *Technology applications TEKS.* Retrieved on: December 17, 2020. from https://tea.texas.gov/Academics/Curriculum_Standards/TEKS_Texas_Essential_Knowledge_and_Skills_(TEKS)_Review/Technology_Applications_TEKS/

Texas Education Agency. (2018). *Snapshot 2018: Community type*. Retrieved on: February 17, 2021: from https://rptsvr1.tea.texas.gov/perfreport/snapshot/2018/commtype.html

Texas Education Agency (2018). 2018 Comprehensive biennial report on Texas public schools. Retrieved on December 17, 2020. from https://tea.texas.gov/sites/default/files/comp_annual_biennial_2018.pdf

Texas Education Agency. (2018). *Pocket edition.* Retrieved February 24, 2020, from https://tea.texas.gov/about-tea/news-and-multimedia/brochures/pocket-edition

Texas Education Agency (2017). *District type glossary of terms, 2015–2016*. http://tea.texas.gov/acctres/analyze/1516/gloss1516.html#Rural

Texas Education Agency. (2017). *Texas rural school task force report: Elevating support for Texas rural and small schools.* Retrieved on December 18, 2020. from https://tea.texas.gov/Texas_Educators/Educator_Initiatives_and_Performance/Rural_Schools_Task_Force/

The International Society for Technology in Education. (2021). *ISTE Standards.* Retrieved on April 15, 2021, from https://www.iste.org/standards

Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Educational Technology Research and Development, 65*, 555–575.

Trotter, A. (2008). Online learning evolves: Keeping pace with K-12 online learning: A review of state-level policy and practice. *Education Week*, *10*.

Turale, S. (2020). A brief introduction to qualitative description: A research design worth using. *Pacific Rim International Journal of Nursing Research*, *24*(3), 289–291.

Turner, S. F., Cardinal, L. B., & Burton, R. M. (2017). Research design for mixed methods. *Organizational Research Methods*, *20*(2), 243–267. https://doi.org/10.1177/1094428115610808

UCLA. (n.d.) *What does Cronbach's Alpha mean?* Statistical consulting. Retrieved August 08, 2020, from https://stats.idre.ucla.edu/spss/faq/what-does-cronbachs-alpha-mean/

United States Department of Education. (2019). *Use of technology in teaching and learning*. https://www.ed.gov/oii-news/use-technology-teaching-and-learning

U.S. Department of Education. (2017). Reimagining the role of technology in education. *2017 National Education Technology Plan Update.* https://tech.ed.gov/files/2017/01/NETP17.pdf

Van Deursen, A., Helsper, E., Eynon, R., & Van Dijk J. (2017). The compoundness and sequentiality of digital inequality. *International Journal of Communication*, *11*, 452–473.

Vareberg, K., & Platt, C. A. (2018). Little tech on the prairie: Understanding teachers' adoption of and resistance to technology in the rural classroom. *Journal of the Communication, Speech & Theatre Association of North Dakota*, *31*, 27–42.

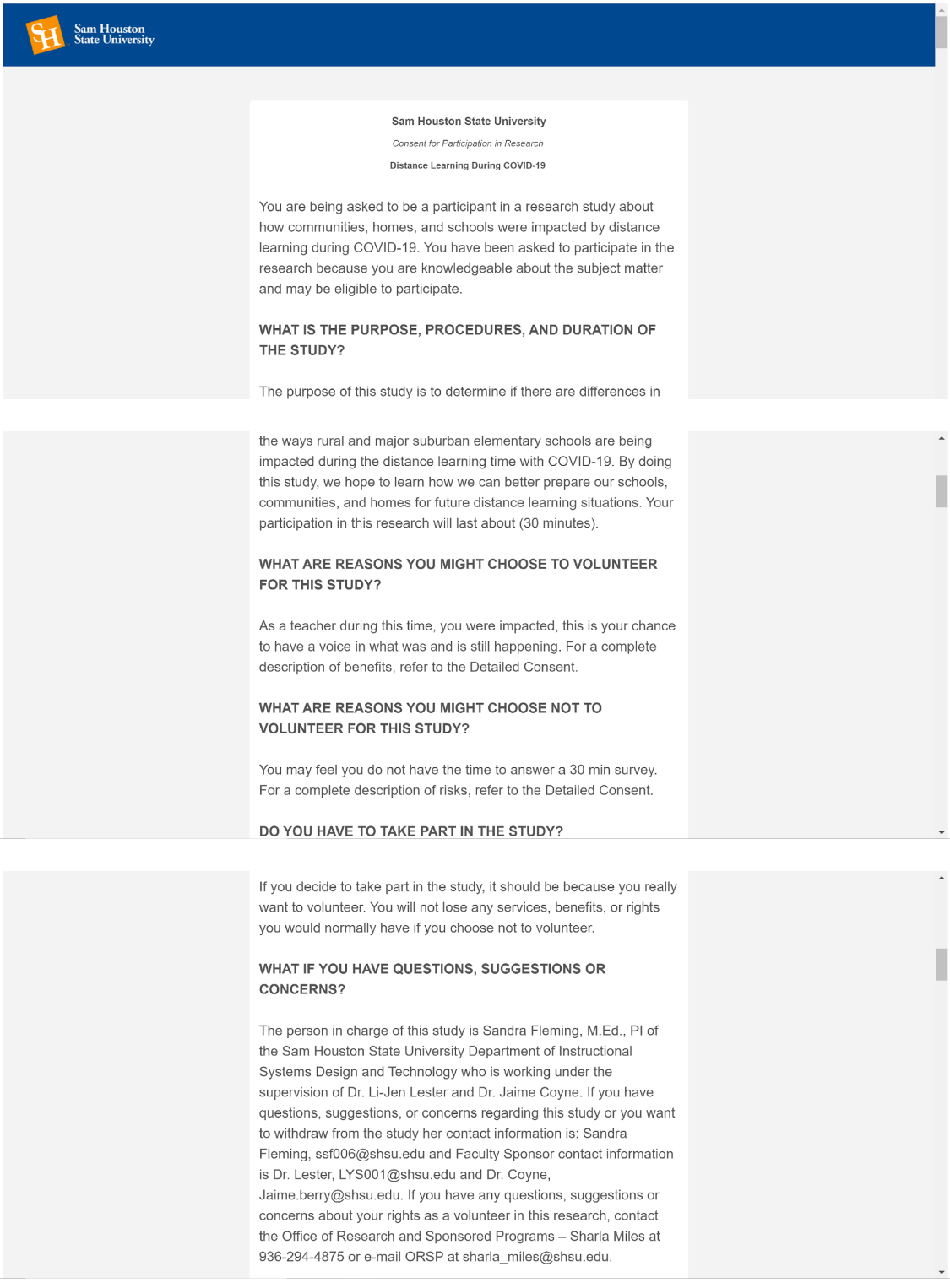
Verstegen, D. (2015). On doing an analysis of equity and closing the opportunity gap. *Education Policy Analysis Archives, 23*(41).

Von Glasersfeld, E. (1995). A constructivist approach to teaching. In L. P. Steffe & J. Gale (eds.), *Constructivism in education* (pp. 3–15). Lawrence Erlbaum Associates.

Vygotsky, L. S. (1962). *Thought and language*. Cambridge, MA: MIT Press.

World Health Organization (2020). *Strategy and planning.* Retrieved September 08, 2020, from https://www.who.int/emergencies/diseases/novel-coronavirus-2019/strategies-and-plans

# APPENDIX A



Sam Houston State University

**Sam Houston State University**

*Consent for Participation in Research*

**Distance Learning During COVID-19**

You are being asked to be a participant in a research study about how communities, homes, and schools were impacted by distance learning during COVID-19. You have been asked to participate in the research because you are knowledgeable about the subject matter and may be eligible to participate.

**WHAT IS THE PURPOSE, PROCEDURES, AND DURATION OF THE STUDY?**

The purpose of this study is to determine if there are differences in the ways rural and major suburban elementary schools are being impacted during the distance learning time with COVID-19. By doing this study, we hope to learn how we can better prepare our schools, communities, and homes for future distance learning situations. Your participation in this research will last about (30 minutes).

**WHAT ARE REASONS YOU MIGHT CHOOSE TO VOLUNTEER FOR THIS STUDY?**

As a teacher during this time, you were impacted, this is your chance to have a voice in what was and is still happening. For a complete description of benefits, refer to the Detailed Consent.

**WHAT ARE REASONS YOU MIGHT CHOOSE NOT TO VOLUNTEER FOR THIS STUDY?**

You may feel you do not have the time to answer a 30 min survey. For a complete description of risks, refer to the Detailed Consent.

**DO YOU HAVE TO TAKE PART IN THE STUDY?**

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any services, benefits, or rights you would normally have if you choose not to volunteer.

**WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS OR CONCERNS?**

The person in charge of this study is Sandra Fleming, M.Ed., PI of the Sam Houston State University Department of Instructional Systems Design and Technology who is working under the supervision of Dr. Li-Jen Lester and Dr. Jaime Coyne. If you have questions, suggestions, or concerns regarding this study or you want to withdraw from the study her contact information is: Sandra Fleming, ssf006@shsu.edu and Faculty Sponsor contact information is Dr. Lester, LYS001@shsu.edu and Dr. Coyne, Jaime.berry@shsu.edu. If you have any questions, suggestions or concerns about your rights as a volunteer in this research, contact the Office of Research and Sponsored Programs – Sharla Miles at 936-294-4875 or e-mail ORSP at sharla_miles@shsu.edu.

**DETAILED CONSENT**

Distance Learning During COVID 19

**Why am I being asked?**

You are being asked to be a participant in a research study about distance learning during COVID-19 conducted by Sandra Fleming, M.Ed. Principal Investigator (PI), from the department of Instructional Systems Design and Technology at Sam Houston State University. I am conducting this research under the direction of Dr. Li-Jen Lester and Dr. Jaime Coyne. You have been asked to participate in the research because you are a experiencing this situation and may be eligible to participate. We ask that you read this form and ask any questions you may have before agreeing to be in the research.

Your participation in this research is voluntary. Your decision whether or not to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

**Why is this research being done?**

This is a survey to compare rural and major suburban elementary schools' distance learning situations during COVID 19.

**What is the purpose of this research?**

The purpose of this research is: to determine if there is a difference between rural and major suburban schools, and what can we learn from this situation that can help to improve the way distance learning is handled.

**What procedures are involved?**

If you agree to be in this research, we would ask you to do the following things:
Complete a survey consisting of 24 statements you would rank using

a seven-point likert-like scale items (1 = strongly disagree, 2= disagree, 3 = somewhat disagree, 4 = neither agree nor disagree, 5 = agree somewhat, 6 = agree, and 7 = strongly agree), and answer 4 open response questions.

After agreement to participate the survey will begin and it should take approximately 30 minutes to complete.

**What are the potential risks and discomforts?**

The research has no potential risks for participants.

**Are there benefits to taking part in the research?**

COVID-19 shutting schools down, and forcing education to make changes is something we all can learn from. Taking time to complete this survey will add to the research being done and help educational decision makers understand the circumstances surrounding the distance learning during COVID 19.

**What about privacy and confidentiality?**

The only people who will know that you are a research participant are members of the research team. No information about you, or provided by you during the research will be disclosed to others without your written permission, except:
- if necessary, to protect your rights or welfare (for example, if you are injured and need emergency care or when the SHSU Protection of Human Subjects monitors the research or consent process); or
-if required by law.
When the results of the research are published or discussed in conferences, no information will be included that would reveal your identity.
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law.
Your survey responses will be kept confidential to the extent of the technology being used. Qualtrics collects IP addresses for respondents to surveys they host; however, the ability to connect your survey responses to your IP address has been disabled for this survey. That means that I will not be able to identify your responses. You should, however, keep in mind that answers to specific questions may make you more easily identifiable. The security and privacy policy for Qualtrics can be viewed at https://www.qualtrics.com/security-statement/.
Your personal information will be coded to protect your identity, and stored on a file only accessible to the principal investigator. Consent will be solicited through e-mail. Individual responses to surveys will be destroyed, following analyses of the data, and publication of dissertation.

**What if I am injured as a result of my participation?**

In the event of injury related to this research study, you should contact your physician or the University Health Center. However, you or your third-party payer, if any, will be responsible for payment of this treatment. There is no compensation and/or payment for medical treatment from Sam Houston State University for any injury you have from participating in this research, except as may by required of the University by law. If you feel you have been injured, you may contact the researcher, Sandra Fleming, M.Ed. at 979-324-2434.

**What are the costs for participating in this research?**

None

**Will I be reimbursed for any of my expenses or paid for my participation in this research?**

No

**Can I withdraw or be removed from the study?**

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study.

**Who should I contact if I have questions?**

The researcher conducting this study is Sandra Fleming, M.Ed. You may contact the researcher at: Phone: 979-324-2434. The faculty advisors are Dr. Li-Jen Lester and Dr. Jaime Coyne. You may contact them at Dr. Lester's phone 936-294-1582, and Dr. Coyne's phone 936-294-1137.

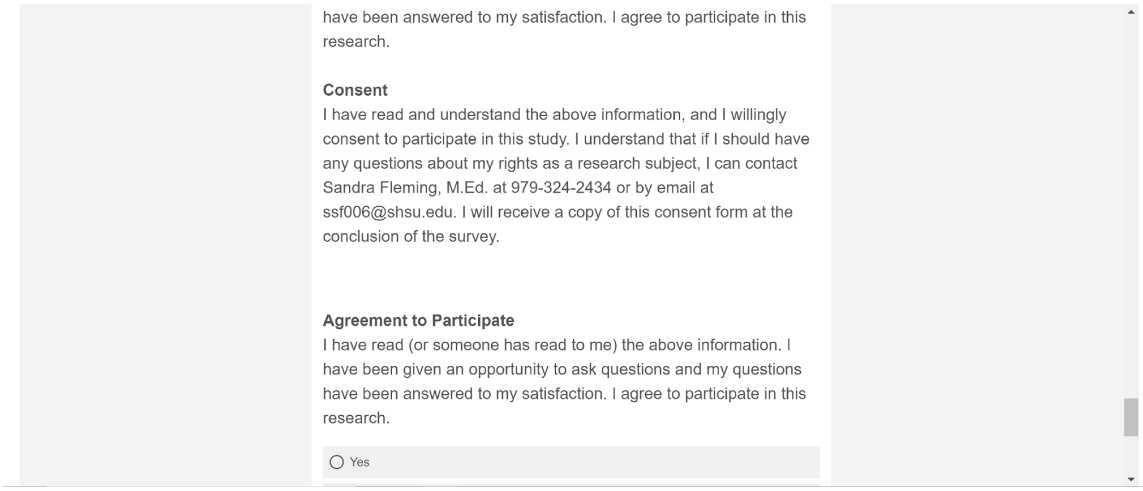
**What are my rights as a research subject?**

If you feel you have not been treated according to the descriptions in this form, or you have any questions about your rights as a research participant, you may call the Office of Research and Sponsored Programs – Sharla Miles at 936-294-4875 or e-mail ORSP at sharla_miles@shsu.edu.

You may choose not to participate or to stop your participation in this research at any time. Your decision whether or not to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

**You will not be offered or receive any special consideration if you participate in this research.**

**Agreement to Participate**
I have read (or someone has read to me) the above information. I have been given an opportunity to ask questions and my questions

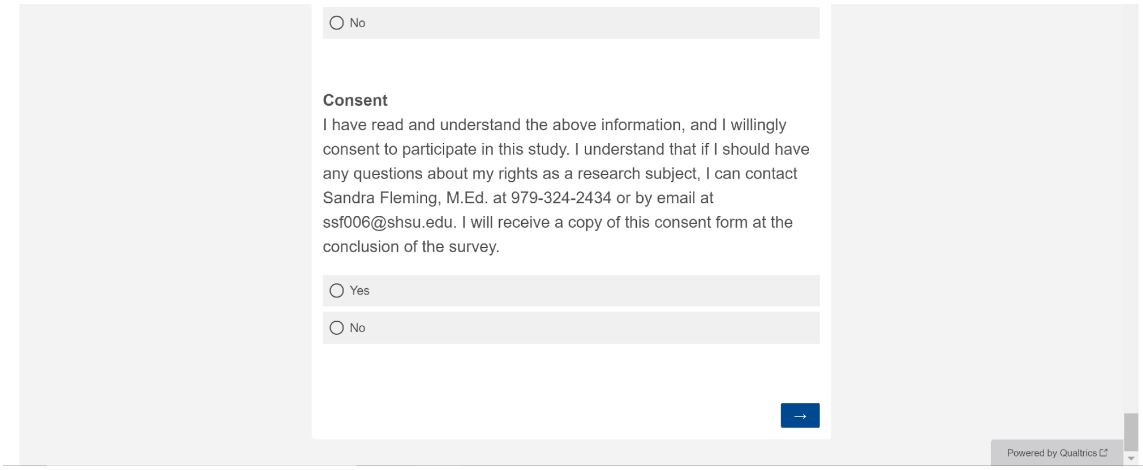


have been answered to my satisfaction. I agree to participate in this research.

**Consent**
I have read and understand the above information, and I willingly consent to participate in this study. I understand that if I should have any questions about my rights as a research subject, I can contact Sandra Fleming, M.Ed. at 979-324-2434 or by email at ssf006@shsu.edu. I will receive a copy of this consent form at the conclusion of the survey.

**Agreement to Participate**
I have read (or someone has read to me) the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I agree to participate in this research.

- ◯ Yes
- ◯ No



**Consent**
I have read and understand the above information, and I willingly consent to participate in this study. I understand that if I should have any questions about my rights as a research subject, I can contact Sandra Fleming, M.Ed. at 979-324-2434 or by email at ssf006@shsu.edu. I will receive a copy of this consent form at the conclusion of the survey.

- ◯ Yes
- ◯ No

→

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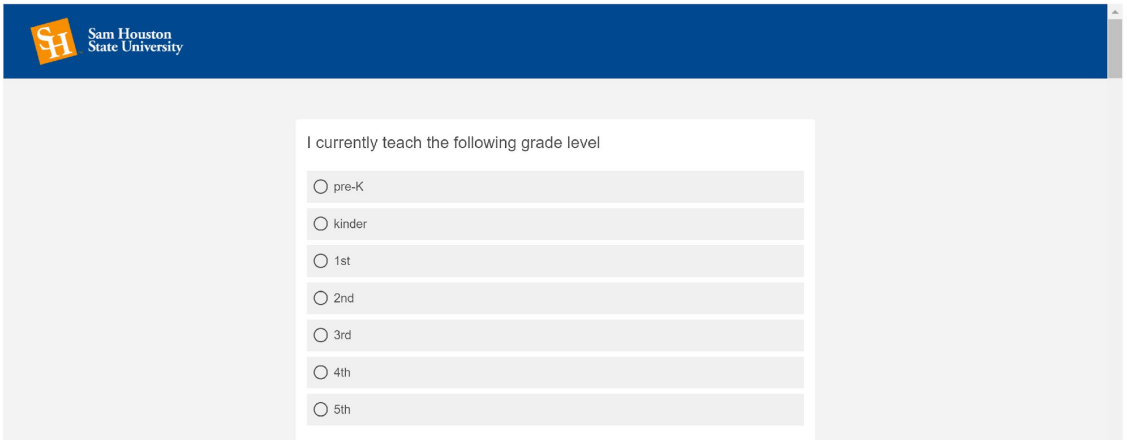

Sam Houston State University

I currently teach the following grade level

- ◯ pre-K
- ◯ kinder
- ◯ 1st
- ◯ 2nd
- ◯ 3rd
- ◯ 4th
- ◯ 5th

What district do you currently teach in?

According to this definition of **Technology**, Texas Education Agency, TEA (February 2017), gives the following examples to define technology: computer workstations, laptop computers, wireless computers, handheld computers, digital cameras, probes, scanners, digital video cameras, televisions, telephones, digital projectors, programmable calculators, interactive white boards. Approximately how many student devices are in your classroom. Student devices meaning - devices that the students use,

- ◯ 0 - 5
- ◯ 5 - 10
- ◯ 10 - 15
- ◯ 15 - 20
- ◯ 20 +

During distance learning in the community

| | Strongly agree | Agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|---|
| Internet is readily available in most areas of my school zone. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Internet is reliable on a regular basis in all areas of my school zone. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Internet cost is made affordable to all students in my school zone. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Technology is available to use for learning purposes. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| When I need assistance with technology, help is easy to find. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| I know someone who knows how to help me with technology. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| I can help others when then need help with technology. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| There is a local place where you can get help with technology. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

Is there anything unique about how your community handled learning and meeting the needs of students during the schools being shut down due to COVID-19 that you feel would be important for others to know?

During distance learning in the student homes

| | Strongly agree | Agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|---|
| All students have access to technology to access learning online at home. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Students are capable of navigating the internet to complete assignments at home. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Students communicate with their teachers through online platforms (Dojo, SeeSaw, Class Craft, Google Classroom, Edmodo, Canvas, Blackboard, Remind, etc…). | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Students access video conferencing tools (Zoom, Google Meet, Google Hangouts, Skype, Facetime, etc) to participate in academic conversations with peers and teachers. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| There is a designated time for learning each day and a parent or guardian available to help monitor focused time on task. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Parents can help students navigate learning online and provide support when needed. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Parents or guardians are available to help with learning. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Parents or guardians are capable of helping with learning. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

What needs were unique to your students' families that may not have been mentioned above that you feel would be important for others to learn from?

Are there any concerns you have about families during school shutdown situations that you would like to share?

During distance learning in the school

| | Strongly agree | Agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|---|
| My school provides platforms (Dojo, SeeSaw, Class Craft, Google Classroom, Edmodo, Canvas, Blackboard, Remind, etc…) for teachers and students to use for online learning. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My school has readily available technology help desk for any problems I encounter. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My school can supply internet and/or computer devices for any student that does not have access to it at home. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I have access to technology needed to provide quality education to my students. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I have guidance and support on how to transition from in class learning to distance learning. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My school provided me with training on teaching in an online environment. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My school continually provided me with resources to support my transition to online teaching. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My school continually kept me informed of my responsibilities, and helped me to meet the needs of my students. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Every school is unique, and things happened quickly. Schools are to be commended for doing so much with so little guidance. Knowing what you know now. What advice would you give or like to share for people who want to learn from this situation?

→

**APPENDIX B**

## Sam Houston State University

Consent for Participation in Research

*Distance Learning During COVID-19*

You are being asked to be a participant in a research study about *how communities, homes, and schools were impacted by distance learning during COVID-19.* You have been asked to participate in the research because *you are knowledgeable about the subject matter* and may be eligible to participate.

**WHAT IS THE PURPOSE, PROCEDURES, AND DURATION OF THE STUDY?**

*The purpose of this study is to determine if there are differences in the ways rural and major suburban elementary schools are being impacted during the distance learning time with COVID-19.* By doing this study, we hope to learn *how we can better prepare our schools, communities, and homes for future distance learning situations.* Your participation in this research will last about *(30 minutes)*.

**WHAT ARE REASONS YOU MIGHT CHOOSE TO VOLUNTEER FOR THIS STUDY?**

*As a teacher during this time, you were impacted, this is your chance to have a voice in what was and is still happening.*

For a complete description of benefits, refer to the Detailed Consent.

**WHAT ARE REASONS YOU MIGHT CHOOSE NOT TO VOLUNTEER FOR THIS STUDY?**

*You may feel you do not have the time to answer a 30 min survey.*

For a complete description of risks, refer to the Detailed Consent.

**DO YOU HAVE TO TAKE PART IN THE STUDY?**

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any services, benefits, or rights you would normally have if you choose not to volunteer.

**WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS OR CONCERNS?**

The person in charge of this study is *Sandra Fleming, M.Ed., PI* of the Sam Houston State University Department of *(Instructional Systems Design and Technology)* who is working under the supervision of *Dr. Li-Jen Lester and Dr. Jaime Coyne.* If you have questions, suggestions, or concerns regarding this study or you want to withdraw from the study her contact information is: *Sandra Fleming, ssf006@shsu.edu, and Faculty Sponsor contact information is Dr. Lester, LYS001@shsu.edu and Dr. Coyne, Jaime.berry@shsu.edu*. If you have any questions, suggestions or concerns about your rights as a volunteer in this research, contact the Office of Research and Sponsored Programs – Sharla Miles at 936-294-4875 or e-mail ORSP at sharla_miles@shsu.edu.

# Sam Houston State University

Consent for Participation in Research

DETAILED CONSENT

*Distance Learning During COVID 19*

**Why am I being asked?**

You are being asked to be a participant in a research study about *distance learning during COVID-19* conducted by *Sandra Fleming, M.Ed. Principal Investigator (PI), from the department of Instructional Systems Design and Technology* at Sam Houston State University. I am conducting this research under the direction of *Dr. Li-Jen Lester and Dr. Jaime Coyne.* You have been asked to participate in the research because *you are a experiencing this situation* and may be eligible to participate. We ask that you read this form and ask any questions you may have before agreeing to be in the research.

Your participation in this research is voluntary. Your decision whether or not to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

**Why is this research being done?**

This is a survey to compare rural and major suburban elementary schools' distance learning situations during COVID 19.

**What is the purpose of this research?**

The purpose of this research is: to determine if there is a difference between rural and major suburban schools, and what can we learn from this situation that can help to improve the way distance learning is handled.

**What procedures are involved?**

If you agree to be in this research, we would ask you to do the following things:

*Complete a survey consisting of 24 statements you would rank using a* six-point Likert-like scale items (0 = *strongly disagree, 1= disagree,* 2 = *slightly disagree,* 3 = *slightly agree,* 4 = *agree and 5 = strongly agree), and answer 4 open response questions.*

*After agreement to participate a link to the survey will be sent to you, and it should take approximately 30 minutes to complete.*

**What are the potential risks and discomforts?**

*The research has no potential risks for participants.*

**Are there benefits to taking part in the research?**

*COVID-19 shutting schools down, and forcing education to make changes is something we all can learn from. Taking time to complete this survey will add to the research being done and help educational decision makers understand the circumstances surrounding the distance learning during COVID 19.*

**What about privacy and confidentiality?**

The only people who will know that you are a research participant are members of the research team. No information about you, or provided by you during the research will be disclosed to others without your written permission, except:

- if necessary, to protect your rights or welfare (for example, if you are injured and need emergency care or when the SHSU Protection of Human Subjects monitors the research or consent process); or

-if required by law.

When the results of the research are published or discussed in conferences, no information will be included that would reveal your identity.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law.

Your survey responses will be kept confidential to the extent of the technology being used. Qualtrics collects IP addresses for respondents to surveys they host; however, the ability to connect your survey responses to your IP address has been disabled for this survey. That means that I will not be able to identify your responses. You should, however, keep in mind that answers to specific questions may make you more easily identifiable. The security and privacy policy for Qualtrics can be viewed at https://www.qualtrics.com/security-statement/.

*Your personal information will be coded to protect your identity, and stored on a file only accessible to the principal investigator. Consent will be solicited through e-mail. Individual responses to surveys will be destroyed, following analyses of the data, and publication of dissertation.*

**What if I am injured as a result of my participation?**

In the event of injury related to this research study, you should contact your physician or the University Health Center. However, you or your third-party payer, if

any, will be responsible for payment of this treatment. There is no compensation and/or payment for medical treatment from Sam Houston State University for any injury you have from participating in this research, except as may by required of the University by law. If you feel you have been injured, you may contact the researcher, *Sandra Fleming, M.Ed.* at *979-324-2434.*

**What are the costs for participating in this research?**

*None*

**Will I be reimbursed for any of my expenses or paid for my participation in this research?**

*No*

**Can I withdraw or be removed from the study?**

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study.

**Who should I contact if I have questions?**

The researcher conducting this study is *Sandra Fleming, M.Ed.* You may contact the researcher at: Phone: *979-324-2434.* The faculty advisors are *Dr. Li-Jen Lester and Dr. Jaime Coyne.* You may contact them at Dr. Lester's phone 936-294-1582, and Dr. Coyne's phone 936-294-1137.

**What are my rights as a research subject?**

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You *will not* be offered or receive any special consideration if you participate in this research.

**Agreement to Participate**

I have read (*or someone has read to me)* the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I agree to participate in this research.

**Consent:** I have read and understand the above information, and I willingly consent to participate in this study. I understand that if I should have any questions about my rights as a research subject, I can contact *Sandra Fleming, M.Ed.* at *979-324-2434* or by email at *ssf006@shsu.edu*. I will receive a copy of this consent form at the conclusion of the survey.

4/15/2021 11:31 AM

**VITA**

***Sandra S. Fleming, M.Ed.***

## Professional Experience:

Normangee ISD — August 2016 – Present
Normangee Elementary
Bryan Independent School District
Johnson Elementary — August 2002 – June 2016
Texas A&M University
Mentor to student teachers — August 2007 – Present

## Educational Experience:

**Sam Houston State University,** Huntsville, TX — May 2021
Dr. of Education, Instructional Systems and Design Technology

**Sam Houston State University**, Huntsville, TX — August 2015
Masters of Education Instructional Technology

**Texas A&M University**, College Station, TX — May 2002
Bachelor of Science in Elementary Education

## Awards / Recognitions:

Sam Houston State University Honor Society — 2014
HEB Excellence in Education Statewide Semi-Finalist — 2012
Dean's List, Texas A&M University — Fall 2001
Distinguished Student, Texas A&M University — Summer 2001

## Publications / Conferences:

"Implications of iPad use in the Classroom" — February 2017
TCEA (Texas Computer Education Association)
"Learning Unplugged: iPads in the Classroom" — June 2016
ISTE (International Society for Technology in Education
The Texas Forum of Teacher Education
"Attitudinal and Behavioral Barriers of Technology Adoption by Teachers" — Oct. 2014
Consortium of State Organizations for Texas Teacher Education (CSOTTE)
Breaking Down Barriers Between Teachers and Technology — Oct. 2014