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Elementary Teachers' Experiences with Remote Learning and its Impact on Science Instruction: Multiple Cases from the Early Response to the COVID-19 Pandemic

Beth Pesnell
University of Arkansas, Fayetteville

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Elementary Teachers' Experiences with Remote Learning and its Impact on Science Instruction:
Multiple Cases from the Early Response to the COVID-19 Pandemic

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Curriculum and Instruction

by

Beth Pesnell
Harding University
Bachelor of Arts in Music, 1996
Harding University
Master of Education in Elementary Education, 1997

December 2020
University of Arkansas

This dissertation is approved for recommendation to the Graduate Council.

William F. McComas, Ph.D.
Dissertation Director

Stephen R. Burgin, Ph.D.
Committee Member

Cathy Wissehr, Ph.D.
Committee Member

Abstract

Teachers across the United States and worldwide found themselves in unprecedented educational situations during the early response period to the COVID-19 pandemic in spring of 2020. Efforts to quarantine and provide social distancing to prevent the spread of the disease brought mandated school closures throughout the United States, and teachers were required to pivot from their traditional, in-person instructional methods and deliver instruction remotely. This phenomenological multiple-case study explored the experiences of 10 elementary teachers with remote learning during the early response period and sought to understand the delivery of science instruction in the remote learning experience. Weekly interviews were conducted with each teacher over the nine-week remote learning period during the spring of 2020 to focus on their experiences each week in delivering and modifying instruction, engaging students in learning, communicating with parents and students throughout the process, and their perceptions of the involved conditions, situations, or issues of the week. A follow-up interview was conducted in September 2020 to capture the experiences of their transitions back to the classroom while still facing the COVID-19 pandemic. Case studies describing the experiences of the participants were written to capture the essence of what each teacher experienced and the factors that influenced their experiences, and a cross-case synthesis was conducted to draw conclusions and make comparisons across the experiences. Results indicated that literacy and mathematics were the focus of instruction during this remote learning period, giving students minimal opportunities to engage in science content. Teachers delivered instruction through a variety of methods, using digital tools that were often new and unfamiliar. Guidelines and expectations were lacking and did not adequately support teachers. Academic disparities were brought to the forefront due to inadequate access to internet, limited understanding of delivering

instruction via remote methods, and the perception of students and parents was that the remote learning experience was optional and unimportant. This study demonstrates the resiliency and efforts of teachers during times of crisis and provides evidence for district and state level leaders needed to support teachers, parents, and students with similar situations in the future.

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To my Lord and Savior, Jesus Christ, I humbly thank you.

Dedication

In loving memory of my father, William Spurlock, who never saw this adventure.

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Chapter 1: Introduction

In March 2020, the United States joined the rest of the world in a global crisis involving the outbreak of a respiratory illness caused by a novel coronavirus, coronavirus disease 2019, abbreviated “COVID-19”. According to the Centers for Disease Control and Prevention (CDC, 2020), the outbreak first started in Wuhan, China, in late December 2019 (if not earlier), with widespread international infections reported by February 2020. This outbreak was soon characterized as a pandemic, or global outbreak of disease, by the World Health organization on March 11, 2020. While different parts of the world have seen varying levels of COVID-19 activity, the United States was in the acceleration phase of the pandemic by mid-March 2020, and society found itself quickly applying extreme measures to slow the spread of the virus (CDC, 2020). Social-distancing and quarantine measures, as well as “shelter-in-place” orders were mandated by national and state level leaders.

As part of these quarantine, social-distancing measures, schools across the nation closed their buildings based on recommendations and guidance from the Centers for Disease Control and Prevention (CDC, 2020; Map: Coronavirus and School Closures, 2020). According to the Education Commission of the States (2020), many governors directed public schools in their state to use remote methods of instruction shortly after school closure was announced.

Statement of the Problem

In mid-March 2020, teachers across the country found themselves in an unprecedented situation that required them to leave behind their traditional, in-person instructional methods and begin delivering instruction remotely with very little time to prepare for this momentous change. Some states had previous guidance prepared in the case of emergency or exceptional circumstances that would prevent students from physically attending school on campus. For

example, school districts in Arkansas were authorized to use “remote learning” on days when the district is closed for circumstances such as contagious disease outbreak, inclement weather or other acts of God, or utility outages (Arkansas State Legislature Act 862, 2017). Other states found themselves quickly drafting guidelines and statements regarding remote instruction and educational compliance requirements (Education Commission of the States, 2020).

As states made announcements regarding school closures and directed schools to continue instruction via remote methods for a prolonged period, I wondered what the experience of “remote learning” looked like, especially in elementary school. As a former elementary classroom teacher, I knew the complexities of day-to-day instruction in a classroom and wondered how teachers would continue instruction remotely, how they enacted instructional plans in such a short time span, and how they were coping with all this change in the midst of this global crisis. I noted numerous posts on social media outlets from teachers asking for help and advice, while also expressing their panic and stress, as schools closed and forced teachers into unfamiliar instructional delivery methods for “remote learning”.

Teachers feel pressure to address content related to state and often national standards, while creating instructional opportunities that meet the diverse learning needs of students, within specific time constraints or established guidelines. Elementary teachers often forgo science instruction, succumbing to the pressures of high-stakes accountability performance in Reading, Writing, and Math (Blank, 2012). Yet, science plays a critical role in the elementary classroom, providing experiences that support language and logic skills, developing curiosity and wonder, facilitating critical thinking and problem-solving skills, and providing students with foundations and experiences in using skills that will assist them in functioning as scientifically literate citizens (National Science Teachers Association, 2014; Eshach & Fried, 2005; Krajcik, Czerniak,

& Berger, 1999). I found myself wondering what elementary science instruction looked like in the remote learning environment and what adjustments teachers were making to deliver it in these situations. This curiosity fueled my passion to understand how elementary teachers were delivering science instruction and coping with the remote learning experiences.

Purpose of the Study with Conceptual Framework

The purpose of this qualitative study was to understand the experiences of a small group of elementary teachers who continued instruction through various forms of remote instruction during the first six months of the COVID-19 pandemic. Teachers pivoted from onsite classroom instruction to various forms of remote instruction with little warning, minimal preparation, and quick turnaround times. This type of educational shut-down in the United States was unprecedented, and thus little was known about how teachers would pursue and engage in instruction with their students during a global crisis. This study sought to explore how elementary science instruction in the remote learning environment compared with science instruction in the elementary classroom.

A social constructivist perspective was used in this phenomenological multiple-case study, supporting an interpretive approach to the research, with an emphasis on the lived experiences, instructional actions, and realities of the subjects (Creswell, 2013). This was an interactive process, where meaning was co-constructed with the subjects through a multiple interview process exploring their experiences with remote learning during the COVID-19 pandemic.

Significance of the Study

This study is significant in several ways, adding new knowledge regarding how teachers respond and adapt during times of crisis, even with a local and temporary school closure such as

might occur after a tornado or related event. The results of this study provide an awareness regarding the challenges elementary teachers faced when directed to continue instruction via remote methods with our youngest students who are learning fundamental skills and processes. This study offers insights about decisions teachers, school districts, and states make during emergency circumstances, providing information that could guide development of future procedures and plans with remote methods of instruction. The study also offers insights regarding science instruction, technology integration, and remote learning in elementary education. Information gained provides an understanding of the levels of preparedness perceived by these teachers regarding remote methods of instruction and provides valuable information regarding guidance for future teacher training opportunities, professional development, and in teacher-preparation programs.

Research Questions

Question 1:

How did elementary science instruction in the remote learning environment during early response to the COVID-19 pandemic compare with normal or traditional classroom science instruction?

- a) How and why did elementary teachers modify science instruction for remote learning?
- b) What specific factors influenced elementary science instruction in the remote learning environment?
- c) What issues or conditions influenced elementary science instruction in the classroom as schools reopened in the fall of 2020?

Question 2:

What were elementary teachers' experiences as they pivoted from onsite classroom instruction to delivering instruction via remote methods during early response to the COVID-19 pandemic?

- a) In what ways did elementary teachers deliver instruction through remote learning?
- b) What factors influenced their experiences with remote learning?
- c) What issues or conditions influenced instruction in the classroom as they transitioned back to school in the fall of 2020?
- d) What are elementary teachers' perceptions of how this remote learning experience will influence education in the future?

Overview of Research Method

This study utilized qualitative and phenomenological methods with multiple case studies that allowed for a thorough understanding of the phenomenon of elementary teachers' experiences delivering instruction remotely during school closure in the first six months of the COVID-19 pandemic. Teachers were interviewed via videoconference tools from their home, which was their remote learning environment, over multiple weeks, providing multiple sources of data that would focus on the subject's meaning and create a holistic account of the experience (Creswell, 2013). A multiple case study design was used to inquire about the common or shared experiences of the subjects and allowed for analysis of the phenomenon to occur through the multiple perspectives of the subjects (Creswell, 2013; Yin, 2014).

Data collection involved in-depth and multiple interviews conducted via the *Zoom* video conferencing platform (hereafter referred to as "*Zoom*") to understand some of the experiences of 10 elementary teachers who delivered instruction remotely during the school closures (Cohen,

Manion, & Morrison, 2018). Weekly interviews were conducted using semi-structured interview questions to maintain consistency among the interview subjects each week. The weekly interviews continued through the end of each subject's 2019-2020 school year and an additional interview in the fall was conducted to understand the experience each subject had in the transition back to school with reopening or continued remote learning.

Data analysis followed qualitative and phenomenological methods that “seek to grasp the essence of the meanings of a situation as given by each subject” (Cohen, Manion, & Morrison, 2018, p. 301). Data analysis was conducted in four phases: weekly trends and patterns analyzed and compiled, structural and conceptual coding of the interview data, individual case reports written, and cross-case analysis and conclusions. After each week's interviews, the data was reviewed for trends or patterns. These trends and patterns provided the basis for future week's interview questions and supported the structural coding process. Structural coding was applied to the weekly notes captured by the researcher and to each interview transcription to break the data into segments that aligned with the research questions or sub-questions. These segments were divided into smaller conceptual chunks of data within each structural code to support deeper analysis of the data within each research question. The structural codes provided the framework for the individual case reports and cross-case analysis discussions. Data analysis was an ongoing process with the final data analysis allowing for triangulation of data within each case and then across single cases in a cross-case synthesis (Yin, 2014). The final report presents both the individual and unique experiences of each case as well as a cross-case synthesis highlighting the shared experiences of the selected teachers with remote learning during the COVID-19 pandemic.

Assumptions

An assumption in research is a condition we believe to be true but cannot verify (Terrell, 2016). The qualitative nature of this study assumes that the findings are bound by the context of the subjects in the study and their interviews. Meaning in this study is constructed based on the experiences of the subjects and interpreted through my perceptions as the researcher. In addition, I assumed that participating teachers would provide honest answers to the questions asked of them.

Limitations on Generalizability

Limitations are constraints of a study that are outside the control of the researcher and may affect the generalizability of the study's results (Terrell, 2016). There were several limitations on generalizability to this study. This study was limited to subjects that have a prior connection with the researcher, limiting participation of a wider network of teachers. Teachers involved in this study teach in Arkansas and Texas. The experiences from this study may not be generalizable to all elementary teachers in the United States, much less the experiences of all teachers in Arkansas and Texas.

Delimitations

Delimitations are boundaries and choices that narrow the study or factors that were not able to be controlled in the study (Terrell, 2016). One of the delimitations of the study was the location of the participating teachers. Since most of my professional career has occurred within two states, (Arkansas and Texas) many of the professional contacts invited through social media reside and teach in those two states. The decisions made by these states' governors may not be representative of the decisions made by other state officials across the U.S and may not be representative of the context of teaching in Arkansas or Texas. The number of teachers studied is

a relatively small number of teachers experiencing the phenomenon. A more comprehensive analysis could be done; however, time constraints and quarantine measures prevented a larger sample size. The goal of the study was to understand experiences of elementary teachers that delivered instruction remotely during the COVID-19 pandemic and explore how elementary science instruction in the remote learning environment compared to science instruction in the classroom. Since the study focused on the experiences of the participating teachers as shared through interviews, interpretation was limited to the perceptions and experiences shared within the interviews. The teachers in the study had connections with the researcher through social media prior to their participation in the study. This connection could have influenced their willingness to participate as well as what they revealed in the interviews. Time was also a factor in this study both for the researcher and the subjects. Scheduling interviews around the teachers' schedules was complex and there were some limitations to scheduling interviews in a timely fashion. This study was situated in the context of a global pandemic due to COVID-19 and the teachers involved were experiencing results of the trauma of this crisis, too.

Reflexivity Statement

The researcher has been an educator for 23 years. She taught in elementary classroom settings, served as an intervention specialist, served as an English as a Second Language specialist, served as a district-level K-8 Math and Science Curriculum Specialist, and currently provides professional development, instructional coaching, and leadership consulting for organizations in the areas of science, mathematics, and STEM. Her first-hand experiences with teaching in an elementary classroom offer her an insider's perspective to the many facets of day-to-day schedules and instructional expectations of an elementary classroom teacher. Having held positions at both the school-level and district-level, she understands the politics of administration

and duties involved in administrative positions. As an instructional coach, she supports teachers with best practices in the classroom and implementing research-based practices for maximum results. She conducts her consulting and coaching business predominantly online and is familiar with many educational technology platforms that teachers were experiencing for the first time during this experience.

While the researcher's background provided a foundation for empathy and understanding throughout the study, this may have also resulted in opportunities for bias and judgement-making. Also, since the researcher was familiar with almost all the subjects, there was often a more casual, conversational tone to the interviews. However, this was beneficial to the subjects and to the progress of the study because it put individuals at ease and allowed them to be more forthcoming with their thoughts. However, it was also a disadvantage because the researcher could slip into the instructional coaching role if she were not intentional about her role as researcher.

These experiences will shape the interpretation of the subjects' experiences and support the generalizations, conclusions, and implications drawn from the study. She understands the importance of science education in the elementary classroom and has a vast knowledge of the standards that students should be actively engaging in at each level. This knowledge supported the comparisons drawn between science instruction in the classroom and in the remote learning environment. Her educational technology background offered a framework for understanding difficulties with technology, student participation and engagement, and teacher self-efficacy with implementation of technology. Having worked in a classroom, she understands the role that communication plays with parents, teammates, principals, and district administrators. Her experience as a district-level curriculum specialist provides a perspective of the complexities

involved in designing and implementing curriculum and training teachers in their use and implementation of this curriculum. It also provides a lens of awareness to curricular areas that receive greater emphasis in elementary instruction. While all these perspectives shaped the interactions with subjects and the interpretation of their experiences, the researcher intentionally separated any biases brought from these experiences and kept an open mind when analyzing and drawing conclusions.

Organization of the Dissertation

The subsequent chapter provides a literature review examining rationales for science instruction in the elementary classroom and challenges that elementary teachers face in delivering science instruction in the classroom. A brief background of school closures due to crisis is provided as well as a discussion on remote learning and the state contexts for remote learning during the COVID-19 pandemic. Discussions on teacher resiliency, teaching during a crisis and teacher self-efficacy are offered and gaps in the literature are presented. Chapter Three provides an account of the methodology used in this qualitative multiple-case study and provides detailed explanations of data collection and data analysis. In Chapter Four, the individual case subjects are introduced and followed by their individual case reports. Chapter Five presents the cross-case analysis, organized separately by research questions. Finally, Chapter Six presents the summary of the study's findings and provides conclusions and implications gleaned from the study.

Chapter 2: Literature Review

School districts across the United States and worldwide found themselves in uncharted territory in March 2020, navigating through recommendations from the U.S. Centers for Disease Control and Prevention (CDC), the World Health Organization (WHO), and many national and state leaders regarding measures to prevent and contain the spread of the novel coronavirus, COVID-19 (CDC, 2020; Map: Coronavirus and School Closures, 2020). Governors across the U.S. directed public schools in their states to close their buildings and begin delivering instruction via remote and alternative methods of instruction. While some states had plans in place for alternative methods during ‘bad weather days’, many states, districts, and teachers found themselves inadequately prepared for the task of delivering alternative methods of instruction over an extended period of time (Coronavirus Closes Schools for Half of All Kids in the U.S., Now What?, 2020; Education Commission of the States, 2020).

This study seeks to understand the experiences of elementary teachers delivering instruction remotely during the COVID-19 pandemic and seeks to explore how elementary science instruction in remote learning compared to their science instruction in the classroom. As this is an unprecedented national phenomenon, little research exists on the topic of teaching remotely during a pandemic. There is research about the importance of science instruction in elementary education and with remote learning experiences, however very little research exists investigating remote learning with elementary students. The literature review provides insights on the rationales for the inclusion of science in the elementary classroom and the challenges elementary teachers face with science instruction. The literature review also discusses experiences with school closures during times of crisis and explores strategies used with remote learning. State level contexts with remote learning during the early response to the COVID-19

pandemic are discussed and insights are provided on teacher resilience and teaching in times of crisis, as well as teacher self-efficacy. The review concludes after gaps in the literature are provided.

Rationales for Science in the Elementary Curriculum and Classroom

Elementary science instruction lays the foundations for developing students who are scientifically literate and have an appreciation for science. *A Framework for K-12 Science Education* lays out a vision for science and engineering education that would prepare all students for “what they should know for their individual lives and for their roles as citizens in this technology-rich and scientifically complex world” (National Research Council, 2012, p. 10). Prior to the release of the framework mentioned above, *Science for All Americans* (American Association for the Advancement of Science, 1989) provided recommendations on what understandings and ways of thinking are essential for all citizens in a world shaped by technology and science. They shared these thoughts on the purpose of education and science education, in particular:

Education has no higher purpose than preparing people to lead personally fulfilling and responsible lives. For its part, science education – meaning education in science, mathematics, and technology – should help students to develop the understandings and habits of mind they need to become compassionate human beings able to think for themselves and to face life head on. It should equip them also to participate thoughtfully with fellow citizens in building and protecting a society that is open, decent, and vital...Scientific habits of mind can help people in every walk of life to deal sensibly with problems that often involve evidence, quantitative considerations, logical arguments, and uncertainty... (p. xii-xiv).

Students must be open to learning about the world around and will need to apply their understanding of scientific concepts, principles, and skills to be informed citizens and consumers (National Research Council, 2007). Beatty and Schweingruber (2017) define being ‘science literate’ as the ability “to see how and why science and engineering really matter, to know how to reason from evidence, and to have a sense of how scientists and engineers do what they do”

(p.5). Forms of these ideas have been the basis for science education for the last century (DeBoer, 1991).

Elementary science instruction cultivates young children’s curiosity, which can sustain their motivation and interest in learning science and promote an interest in science-related careers. Children are naturally curious and ask questions about the world around them. “The questions they ask indicate how they wonder about a diverse range of natural phenomena that cover all science content areas” (Patrick & Mantzicopoulos, 2015, p. 9). Children have a natural tendency to observe and think about nature and naturally want to explore the world around them (Eshach & Fried, 2005). Children have the capacity and ability to observe, explore, and discover the world around them, even at an early age (National Research Council, 2012; Michaels, Shouse, & Schweingruber, 2008). Even before elementary school, young children show sensitivity to the natural world and can use “a variety of high-level causal and relational patterns” to reason about living things (National Research Council, 2007, p. 69). “Children bring to science class a natural curiosity and a set of ideas and conceptual frameworks that incorporate their experiences of the mutual world and other information that they have learned” (National Research Council, 2007). Patrick and Mantzicopoulos (2015) share this belief and agree that children should be encouraged to develop these skills for science learning in the early years of their lives, when their motivation for learning is influenced by their interest in understanding everything around them. Cultivating young children’s curiosity, sustaining their motivation and interest in learning science, and developing their knowledge and ability to reason about scientific concepts requires that teachers provide opportunities for students to engage in “doing science” (National Research Council, 2007).

Elementary science instruction potentially can develop problem-solving skills and promotes critical thinking skills that enable students to solve problems and think critically about the world around them. “Knowledge of science can enable us to think critically and frame productive questions” (Michaels, Shouse, & Schweingruber, 2008, p. 2). The view of science education has shifted over the last 20-30 years, incorporating the idea that “science is both an individual and deeply social enterprise that involves problem solving and the building and testing of models and theories” (National Research Council, 2007, p. 130). The *Next Generation Science Standards* (NGSS Lead States, 2013) involve students in thinking both as scientists and engineers, relying on their knowledge of science or mathematics as well as the engineering design process to define and solve problems that “arise from a specific human need or desire” (National Research Council, 2012). Critical thinking, problem solving, and possessing scientific habits of mind should play a key role in science instruction throughout a student’s academic career. Science instruction in the elementary classroom “must provide opportunities for students to develop understandings and skills necessary to function productively as problem-solvers in a scientific and technological world” (National Science Teachers Association, 2002, p. 1). “Today’s students will need to apply their capacity to think scientifically about global challenges – such as climate change, the production and distribution of food, the supply of water, or pandemic diseases – even if they are not scientists or engineers themselves” (Beatty & Schweingruber, 2017, p. 5). Students, now more than ever, need to be able to understand data and critically examine evidence as citizens grappling with the information overload during this global pandemic (National Academies of Sciences, Engineering, and Medicine, 2020).

Elementary science instruction creates students who will inquire about, discover, and research the world around them, as well as communicating their ideas, methods, and processes

(National Research Council, 2007). Students should be engaged in opportunities that encourage curiosity while practicing methods of science and communication. This includes planning and conducting investigations, sharing ideas with peers, data collection, modeling, developing representations of phenomena, and specialized ways of talking and writing in science (Sandall, 2003). These skills are at the heart of ‘doing science’ and are embedded in several of the Science and Engineering Practices in the Next Generation Science Standards: asking questions and defining problems; developing and using models; planning and carrying out investigations; constructing explanations and design solutions; engaging in argument from evidence; and obtaining, evaluating, and communicating information (NGSS Lead States, 2013). When students are engaged in these practices, they not only hone the skills involved, but are directly experiencing the practices of scientific investigation (National Research Council, 2012).

Elementary science instruction promotes sense-making, reasoning, and the understanding of the power of evidence, leading to better decision-making skills and improving our explanations and arguments. The implementation of the Next Generation Science Standards requires students to move from ‘learning about’ to ‘figuring out’ phenomenon and core ideas using science and engineering practices and crosscutting concepts (NGSS Lead States, 2013). In the 2007 report, *Taking Science to School*, the National Research Council provides research-based evidence for major changes that are needed to improve science education in kindergarten through eighth grade. This report emphasizes that being proficient in science is more than memorizing facts or designing experiments; it asserts that students who are proficient in science will be able to:

1. know, use, and interpret scientific explanations of the natural world,
2. generate and evaluate scientific evidence and explanations,

3. understand the nature and development of scientific knowledge, and
4. participate productively in scientific practices and discourse (p. 2).

Knowledge and reasoning skills are vital for students to demonstrate proficiency not only in science but also to act as educated citizens within society. The building blocks of these proficiencies begin with elementary science instruction.

Elementary science instruction ideally will help students develop conceptual understanding of big ideas that will lead to deeper learning and understanding in later grades and throughout life. *A Framework for K-12 Science Education* describes its principal task as being concerned with “what all students should know in preparation for their individual lives and for their roles as citizens in this technology-rich and scientifically complex world” (National Research Council, 2012, p. 10). This conceptual framework was designed to align the big ideas across K-12 instruction that would “intersect for at least three grade levels” (p.15) and was guided by research-based principles of young children’s capacity to learn science and that the development of true understanding occurs over time (p.24). Conceptual understanding requires multiple and sustained opportunities with ideas over longer periods of time, years rather than weeks or months (National Research Council, 2007).

Why is science instruction important in elementary classrooms? First, it is foundational to future science learning and conceptual understanding with the big ideas, which in turn promotes greater scientific literacy and allows students to participate in society with an educated understanding of these ideas and concepts. Secondly, it provides opportunities for children to develop critical thinking and problem-solving skills through sense-making. They draw upon their innate ability to be curious about the world around them and investigate questions and wonderings. This motivates them to continue to seek answers, ask questions, investigate, and

think critically throughout the process. Third, it provides a common experience with all students for the development of specific skills and habits of mind that are necessary for scientific ways of knowing, thinking, and doing. Finally, it promotes the importance of sense-making, use of evidence to support arguments and thinking, and leads to better decision-making skills that will serve them as they move forward in school and ultimately as a participating citizen in society.

Elementary Teacher Challenges with Science Instruction

According to the 2007 National Research Council's national report *Taking Science to School: Learning and Teaching Science in Grades K-8*, "science should be as non-negotiable a part of basic education as are language arts and mathematics" (p. 34). However, this is not the case in most elementary classrooms, as English language arts and mathematics are the predominant instructional emphasis due to annual accountability measures, a growing number of standards they are expected to teach in the two areas, and internal pressures from school and district leadership for higher achievement in these two areas (Blank, 2012; National Research Council, 2011; Rearden & Broemmel, 2008; Sandall, 2003). Based on data from the 2009 National Assessment of Educational Progress (NAEP) science assessment, a minimized emphasis on science instruction has become a trend nationwide and time for science has dropped to its lowest level since 1988 (Blank, 2012).

Adequate instructional time is only one challenge that teachers face regarding science instruction. Elementary teachers are charged with teaching multiple subject areas within an instructional day to one group of students throughout that day. This requires the teacher to provide instruction in the main content areas of English language arts, mathematics, science, and social studies, and sometimes in specialty areas like art, music, and physical education. The generalist nature of their job may often influence their decisions to make instructional choices

based on their interests or the subject matter in which they are most comfortable (National Academies of Sciences, 2015; Barreto-Espino, Zembal-Saul, & Avraamidou, 2014; Sandall, 2003). Unfortunately, elementary teachers often do not feel prepared to teach the science content in their curriculum (Banilower, et al., 2018; Barreto-Espino, Zembal-Saul, & Avraamidou, 2014; National Research Council, 2011). The 2018 National Survey of Science and Mathematics Education (NSSME) shows there is large discrepancy in elementary teachers' perceptions of being 'very well prepared' to reading/language arts (77%) and to teach science (31%) (Banilower, et al., 2018, p. 32). The lack of feeling prepared to teach specific content areas will affect instructional decisions in the elementary classroom.

Other challenges that face elementary teachers regarding science instruction are lack of resources for teaching and learning, professional development opportunities in science, and pedagogical content knowledge for teaching science (Boakye & Ampiah, 2017; National Academies of Sciences, 2015; National Research Council, 2011). Teachers also face a variety of challenges from sources in the school system, district initiatives, and within their immediate classroom such as: lack of adequate planning time, time management, disciplinary issues with students, varying levels of parental involvement, etc. All these challenges work together to compete for a teacher's attention and can ultimately influence instructional decisions in the classroom.

School Closures During Times of Crisis

Closing school for temporary periods is not a new phenomenon. Natural disasters, such as tornadoes or hurricanes, often result in the temporary shutdown, and sometimes permanent closure, of schools in those affected areas. In 2005, "an estimated 700 schools were affected by Hurricanes Katrina and Rita; many schools remained closed for months or never reopened"

(Esnard, Lai, Wyczalkowski, Malmin, & Shah, 2017). In 2008, over 450 public schools in Texas were closed for at least 10 days due to damage caused by Hurricane Ike (Esnard, et al., 2017). In 2017, damaged caused by Hurricane Matthew left one elementary school in North Carolina closed for seven months. (Esnard, et al., 2017). School closures may also be implemented to slow the spread of seasonal influenza epidemics. At the beginning of the 2009-2010 school year, over 800 schools across the United States closed for several days to stop the spread of the influenza A(H1N1) virus (Wong, et al., 2014). Missing school because of a disaster or disease outbreak can lead students to fall behind in their academic progress and may intensify academic difficulties (Esnard, et al., 2017; Wong, et al., 2014).

To mitigate the spread of COVID-19 in March 2020, the U.S. Centers for Disease Control and Prevention (CDC, 2020a) recommended the closure of schools because of the large number of individuals from within a community who may have close contact in the school environment. School closure decisions were made at the state-level as preventive measures for containing the spread of the virus and in response to national recommendations for consideration of closure (Education Commission of the States, 2020).

As part of the guidance for school closures, the CDC recommended that schools “implement strategies to continue education and related supports for students” that included reviewing their plans for the “continuity of teaching and learning and implement eLearning plans that would include digital and distance learning options where feasible and appropriate” (CDC, 2020b, p.5). Providing opportunities for students to continue learning through eLearning plans during school closure is not novel, either. In 2005, the Louisiana Virtual School increased their capacity to allow students displaced from Hurricane Katrina to continue their educational progress, and in 2012, middle school and high school students who were impacted by Hurricane

Sandy continued their learning through New York state's eLearning platform (Lieberman, 2020). Schools across the country were thrust into developing learning contingency plans during the extensive period of school closure to support continued student learning through a variety of remote learning methods.

Instructional Delivery through Remote Learning Methods

Remote learning, also referred to as distance learning, is defined as an institution-based system of learning where the teacher and learner are separated by distance, time, and/or technology, and where communication systems are used to connect the learners, teachers, and their resources (Arkansas Department of Education, 2020; Burdina, Krapotkina, & Nasyrova, 2019; Rice, 2006; Schlosser & Simonson, 2002). Communicating from a distance includes the use of electronic media and non-electronic forms of communication, such as the U.S. postal service (Rice, 2006). Remote learning methods include print-based, correspondence-style methods, multi-media methods with print, audio, and video technologies, and online delivery options via the Internet (Taylor, 2001). Remote learning methods are characterized by asynchronous and synchronous communication and delivery.

Asynchronous methods: asynchronous learning situations occur in delayed time or in contexts with independent and flexible options (Burdina, Krapotkina, & Nasyrova, 2019; Rice, 2006; Schlosser & Simonson, 2002). Asynchronous learning consists of one-way communication and does not require students to attend meetings at specified times, offering more flexible options for differentiation and self-pacing of instruction (National Academies of Sciences, Engineering, and Medicine, 2020). In asynchronous learning situations, assignments are completed with little to no personal interaction with the teacher or other classmates.

Synchronous methods: synchronous learning situations allow for real-time communication and interaction between the teacher and student and utilize audio and video technologies (Burdina, Krapotkina, & Nasyrova, 2019; Rice, 2006; Schlosser & Simonson, 2002). In synchronous learning situations, students attend scheduled meetings and interact with the teacher and classmates at the same time. Synchronous learning allows for two-way communication and interaction and offers the teacher the opportunity to provide immediate response to any academic concerns (National Academies of Sciences, Engineering, and Medicine, 2020).

While remote learning does not require web-based learning options for communication, online learning tools provide advantages to the communication and interactions between teachers, students, and their caregivers (Burdina, Krapotkina, & Nasyrova, 2019; Rice, 2006). Communication tools such as video conferencing, audio conferencing, and online communication and management tools offer means for teachers and students to communicate, interact, and give or receive feedback. The teacher's role in this type of learning is still important but will be presented differently and will rely on involvement of the learner and their caregivers in the process (Burdina, Krapotkina, & Nasyrova, 2019). The opportunity that families have in the learning environment is valuable. The 2020 report, *Teaching K-12 Science and Engineering During a Crisis*, speaks about the assets of the home and school environment:

Home has always been a setting for learning; but learning at home often looks different than learning in school. The shift to doing formal schooling at home may mean that students, families, and teachers will need to revise how they think about the relationship between school and home and focus more on the experiences and resources that students can access outside of classrooms. This is a valuable opportunity to recognize the assets that families have in their communities, including the natural environment, designed structures, and knowledgeable family and community members. This is particularly true for science and engineering, which focus on explaining phenomena and solving problems in the real world...in home environments, it may be easier to ground learning in places and scenarios that are relevant and meaningful to students (Ch.4, p.1).

Any shift in presentation and involvement will require ongoing professional learning for teachers. Teachers need opportunities to try new strategies, new platforms, and they may need additional support in finding different ways to engage students in class participation and discussion (National Academics of Sciences, Engineering, and Medicine, 2020; Toppin & Toppin, 2016). When schools were shut precipitously and pivoted to remote learning due to COVID-19, there was not time for adequate preparation or professional learning opportunities.

Many of the remote learning options employed as schools pivoted during the early response to the COVID-19 pandemic required technology devices and internet access for students, presenting challenges for many districts across the country. Schools who already had technology devices for all their students had an easier transition to remote learning plans than those schools who had to acquire devices (i.e.: Chromebooks, laptops, mobile hotspots) on the spur of the moment (Elish-Piper, 2020). Unfortunately, acquiring such devices was only one part of the challenge, as students also needed reliable access to the Internet. According to a 2019 report by the Arkansas Department of Commerce, one in 10 households with children in Arkansas have no internet connection. Remote learning options also included physical packets of materials and school supplies that would allow students to complete work at home and not need a device or access to the Internet (National Academies of Sciences, Engineering, and Medicine, 2020).

While districts worked to create remote learning plans, the challenges for any particular school within a district could be quite diverse, therefore decisions regarding remote learning plans often made inequities across the district more apparent (Elish-Piper, 2020; Liberman, 2020; National Academics of Sciences, Engineering, and Medicine, 2020). “With the existing inequities in devices and broadband access, a shift to remote instruction could further limit

underserved students' access to educational supports” (National Academics of Sciences, Engineering, and Medicine, 2020, Ch.3, p.12).

State Level Contexts with Remote Learning

It is common for schools to close for a few days during a school year due to inclement weather or natural disasters. School districts typically build a certain number of inclement weather make-up days into their school calendar. When the number of missed days exceeds the pre-allocated make-up days, schools must find new solutions for making up the missed school time. Adding days to the end of the year, cancelling planned holidays, adding minutes to the remaining school days, and holding Saturday school are just a few of the options districts consider when making up school due to inclement weather or natural disasters (Chen, 2019). At the time of this writing, twelve states had established policies for eLearning days or alternate methods of instruction in the event of weather-related or emergency school closures (Lieberman, 2020). However, most of these plans were not designed for the prolonged school closures experienced during the COVID-19 pandemic. Since teachers from two states, Arkansas and Texas, were included in this study, each of their state contexts for remote learning will be examined.

The Arkansas Context for Remote Learning

The state of Arkansas passed legislation, Act 862, in 2017, that would allow “public school districts and open-enrollment public charter schools to develop a plan for Alternative Methods of Instruction (AMI) to be used on days when the superintendent closed school due to exceptional or emergency circumstances” (Arkansas State Legislature, 2017). The legislation allows for up to the equivalent of ten student attendance days to be granted to school districts that have an approved plan for the use of alternative methods of instruction when the school district is closed due to these circumstances. Alternative methods of instruction plans could

include, but were not limited to, virtual learning (Arkansas Department of Education, 2017). AMI days are to be pre-planned and communicated with all stakeholders, and the AMI work, packets or on-line assignments, must be available on-line or sent home prior to the AMI day (Arkansas Department of Education, 2017). This means that a school district is required to have prepared a series of lessons that could be sent home immediately upon threat of inclement weather or other exceptional circumstance. AMI guidance, provided by the Division of Elementary and Secondary Education at the Arkansas Department of Education (ADE), states that “assignments should be innovative engaging assignments for students and families, not meant to be six hours of seat work” (2017). The examples provided in the guidance document present assignments related to snow day activities in various content areas, pre-assigned leveled reading books, mathematics games and activities to review previously learned skills, and application type activities that could be delivered using learning management systems, current digital learning providers, or other resources available to teachers and students (Arkansas Department of Education, 2017).

COVID-19 presented a new circumstance with prolonged school closure that would require AMI plans beyond the 10 day allotment that did not involve inclement weather or snow day related activities, so plans needed to be revised to provide “reasonable remote learning during this pandemic” (Arkansas Department of Education, 2020, p. 2) Teachers were faced with preparing at least 10 days of AMI plans with very little notice and turnaround time. The Arkansas Department of Education expressed the importance of “a continuation of equitable educational delivery to the students of Arkansas” during this extended time of school closure (Arkansas Department of Education, 2020). The ADE also expressed that “districts and schools will need to persist in their efforts to adapt remote learning efforts to accommodate the needs of

parents and students” (Arkansas Department of Education, 2020, p. 2). To support Arkansas educators during the extended school closures, ADE published the *Arkansas Instructional Guidance for Extended Year AMI* document (2020). This document provides instructional guidance for districts as they work to meet the needs of students outside of the typical school setting during the COVID-19 school closures. ADE encouraged districts to offer multiple AMI options and “not let a single mode of delivery selected for the majority of your students prevent you from thinking globally about meeting the diverse needs that exist across your student body” (Arkansas Department of Education, 2020, p. 4).

This guidance document encouraged districts to determine what is essential and what the level of expectations are for their students and their staff, with a consistent message of *less is more* (p.2). They express that districts have “the flexibility to limit instruction to essential skills in core subjects” (p.4) and that it is “unrealistic for schools to expect students to continue to meet and complete assignments for six to eight teachers or subjects several times a week.” (p.5). Districts were asked to be cautious when introducing new content and encouraged to work on mastery of essential skills that have previously been taught (p.5). Student assignments should be viewed as “valuable and necessary”, offering “quality learning opportunities that integrate essential knowledge and promote students being actively literate, critical thinkers, and community engagement” (p.8). Schools have the flexibility to determine daily schedules, alternating subjects and days, and limitations on the total amount of time per subject per week (p.10).

The document offers guidance regarding the assessment of student access to technology (devices and internet) and the realities facing their communities to determine the most appropriate type of remote learning for their district. If a district plans to “require synchronous

access only, then the district must provide equipment and access for students and staff” to meet the needs of this type of learning (Arkansas Department of Education, 2020, p. 7). Districts are encouraged to provide asynchronous instruction to give flexibility to instructional access, as well as other options, like paper packets, to provide equitable access to all learners. Districts are encouraged to provide on-going professional development to support teachers in working with new virtual platforms and resources. Guidance is also provided regarding expectations and responsibilities of teachers and other staff members during the extended AMI period. Districts are encouraged to monitor their AMI plans over the course of the extended closure, modifying and adjusting as needed.

The Texas Context for Remote Learning

Other states were not prepared to address remote learning at the time of school closure, so school districts closed, as if on break, or extended the spring break holiday. Texas is one example of a state that closed schools and offered extended spring breaks until remote learning and instructional options were able to be developed and implemented (Texas Association of School Administrators, 2020). The Texas Education Agency (TEA) developed an *Instructional Continuity Framework* designed to support districts in launching “at-home schools” to support student mastery of standards and maximize instructional time for students during the remainder of the school year (Texas Education Agency, 2020). This framework offers “information to assist in the delivery of educational resources in this time of public crisis” (Texas Education Agency, 2020). The framework organizes the instructional continuity support resources into phases of work for school districts as they move into the remote learning environment. Phase 1 involves analysis of at-home access to internet and technology devices, instructional materials, and instructional delivery methods. Once districts have determined accessibility, they move into

Phase 2 and determine their instructional materials and delivery methods, plan their curricular scope and sequence for the remainder of the year, and determine accountability monitoring and processes, like grading and attendance policies. Phase 3 supports districts in scheduling instructional days for at-home learning, with guiding principles for instructional time, keeping it simple, and reading options. This phase also provides guidance regarding expectations of staff and communication to support instructional continuity. The final phase offers guidance on monitoring student progress, supporting teachers and their professional development, and providing on-going support to all stakeholders.

Teacher Resilience and Teaching during Times of Crisis

Research describes resilience as an ability to overcome challenges, a process or way of interacting with events, and a trait or quality that one possesses (Mansfield, Beltman, Price, & McConney, 2012). The American Psychological Association (2020) defines resilience as “the process of adapting well in the face of adversity, trauma, tragedy, threats or even significant sources of stress.” Bonanno (2004) explains that “resilience to loss and trauma pertains to the ability of adults, in otherwise normal circumstances, who are exposed to an isolated and potentially highly disruptive event, to maintain relatively stable, healthy levels of psychological and physical functioning (p. 20). According to research that examined attitudes and behaviors of teachers, “teachers who possess characteristics of resilient individuals are more likely to persevere in adverse situations, find it easier to adapt to change...and are less inclined to leave the profession” (Mansfield, Beltman, Price, & McConney, 2012, p. 357). Teacher resilience is an emerging field of research, with evidence that individual and contextual factors play a vital role in the dynamic processes involved in responding to challenging situations (Gu & Day, 2013; Mansfield, Beltman, Price, & McConney, 2012).

“To teach, and to teach at one’s best over time, has always required resilience” (Gu & Day, 2013, p. 22). Teaching even during normal times is a physically and emotionally demanding job. Teachers are continually faced with challenges such as classroom management, heavy workload, lack of training, lack of administrative support, lack of parental support, lack of resources, and realities of students and families beyond their control (Mansfield, Beltman, Price, & McConney, 2012). Individual factors such as coping skills, problem solving skills, several teaching skills, and high levels of efficacy and confidence in teaching abilities all play a role in teacher resilience (Clara, 2017; Mansfield, Beltman, Price, & McConney, 2012). Environmental factors such as mentor support, school and administrative support, support of peers and colleagues, as well as parental support also play a role in teacher resilience (Mansfield, Beltman, Price, & McConney, 2012, p. 359). “Teacher resilience happens when a teacher adapts positively to an adverse situation” (Clara, 2017).

The COVID-19 pandemic presented several adverse and challenging contexts for teachers, as they worked to deliver instruction in a remote learning environment. Teachers may be unprepared to utilize technology tools to deliver on-line instruction and may not have the instructional resources needed to provide quality instruction remotely, leading to feelings of inadequacy. Students may not have access to internet or devices and may not have home environments that will support their basic needs during this time of quarantine. Teachers were also facing this pandemic from a personal level, coping with the quarantine requirements with their own families and struggles.

During times of uncertainty, individuals can feel like victims being thrown into a situation beyond personal control. Trauma from catastrophic situations can alter behaviors and social relationships, slow down learning, and create conflict (Vaccarelli, 2018). In times of crisis

or emergency, teachers are often tasked with playing a central role in providing care and support to their students and parents (Vaccarelli, 2018). The school environment is considered an important support system for children as they cope with tragedy (Noppe, Noppe, & Bartell, 2006) and “teachers are natural partners in developing resilience within the school ecology” (Baum, Rotter, Reidler, & Brom, 2009, p. 69). Vaccarelli (2018) explains that “education is intended as an emancipatory response that takes into account all ramifications of trauma to allow individuals and communities to re-establish the relationship with their world barred from the radical ‘truths’ of the catastrophe” (p.34). Exposure to traumatic events is often linked to psychological distress in children because they lack the ability to process the traumatic event and need support and resources to effectively cope with the experience (Baum, Rotter, Reidler, & Brom, 2009, p. 62). During emergency situations and catastrophes, schools and teachers provide social support and services to the community that nourish relationships, provide mental health care, and offer a sense of normalcy to otherwise stressful situations (Vaccarelli, 2018; Baum, Rotter, Reidler, & Brom, 2009). Unfortunately, most teachers lack the tools, training, and emotional supports to effectively provide such care and intervention for students in times of crisis or trauma (Vaccarelli, 2018; Baum, Rotter, Reidler, & Brom, 2009). Without the proper training, providing this type of care after a traumatic event can lead to emotional strain and burnout with teachers (Baum, Rotter, Reidler, & Brom, 2009).

With the extended school closures in spring 2020, students found themselves isolated and missing their friends and social circles, creating strain on their mental health. Social connections are necessary and important during times of uncertainty and turmoil (National Academies of Sciences, Engineering, and Medicine, 2020). Interpersonal relationships and supportive environments help students thrive and create a sense of belonging which aids in their social and

emotional health and well-being (Kirkland, 2020). Building community and strengthening relationships is important for students both in the classroom and remote learning environments. Teachers had to develop new methods of cultivating relationships and maintaining student connectedness during the COVID-19 pandemic that did not always come as naturally as it would in the classroom setting (National Academies of Sciences, Engineering, and Medicine, 2020).

Disaster and trauma, in the form of both individual and collective trauma, can cause states of confusion and disenchantment that can lead to new anxieties and fears as a new reality of life forms through the experience (Vaccarelli, 2018). During the COVID-19 pandemic, teachers quickly found themselves as part of the community needing to be cared for, while also being care-givers to students and their parents. The emotional world of teachers is linked to that of the students, and learning will not be successful unless the conditions and contexts are created relationally (Vaccarelli, 2018). Vaccarelli refers to this as ‘resilience-together’, or resilience experienced as an identity group (2018, p. 35). Resilience is fostered with positive and healthy support systems, both for students and teachers. Support systems such as mentoring, administrator support, and the support of peers and colleagues play a vital role in developing and fostering resilience in teachers (Mansfield, Beltman, Price, & McConney, 2012).

Teacher Self-Efficacy

Teacher resilience is closely tied to a strong sense of self-efficacy with respect to teaching and motivation to teach (Gu & Day, 2013). While providing care and support to students during traumatic events can be emotionally taxing and cause burnout for some teachers, these situations can also cause us to rediscover the essence and meanings of education (Vaccarelli, 2018; Baum, Rotter, Reidler, & Brom, 2009). Vaccarelli (2018) shares that amid emergencies and catastrophes, teachers often find new meaning to the work they are doing. Resilient teachers have

a strength and determination to fulfill the call to teach (Gu & Day, 2013). A teacher's sense of efficacy contributes to their resilience and effectiveness as a teacher (Gu & Day, 2013).

Self-efficacy refers to people's beliefs about their capability to produce desired results through their own actions (Bandura, 1977; Bandura 1994). A teacher's self-efficacy belief is based on their judgement of their abilities to achieve the desired outcomes of student engagement and learning (Zee & Koomen, 2016; Labone, 2004; Tschannen-Moran & Hoy, 2001). Bandura (1994) outlined four ways in which a strong sense of self-efficacy can be developed: 1) mastery experiences, 2) vicarious experiences, 3) social persuasion, and 4) emotional and physiological reactions. Mastery experiences offer the most effective way to develop self-efficacy as base their beliefs about the future on past experiences (Bandura, 1994). Past successes build greater confidence and self-efficacy, while past failures tend to lead to less confidence and belief in ability. When someone believes they have what it takes to succeed, they will most likely stick with their goals, even during struggles that arise. This is what Bandura calls a "resilient sense of efficacy" (p.71). Self-efficacy can also be developed through vicarious experiences, or by watching other people perform the behavior (Bandura, 1994). The impact of these experiences from models will depend on how the observer sees himself/herself as being like or different from the model. The more similar they perceive themselves to be to the modeled behavior, the greater the efficacy effect; and conversely the more different they perceive themselves from the modeled behavior, the more likely they are to lose faith in their ability to perform the behavior (Bandura, 1994). Social persuasion is the most challenging method to instill strong self-efficacy. Social persuasion involves telling the person they can be successful and persuading them that they have what it takes to succeed (Bandura, 1994). However, negative messages often keep people from achieving what they can, keeping them from even attempting challenging tasks or convincing

them to give up too soon (Bandura, 1994). The final way that self-efficacy beliefs are reinforced is through emotional and physiological reactions we experience when facing a stressful or challenging situation (Bandura, 1994). For those who have high perceived self-efficacy, they may see stress or challenges as an energetic feeling and work to perform their best, while those who have low perceived self-efficacy may see these reactions as a sign of weakness or helplessness (Bandura, 1994).

A teacher with high perceptions of self-efficacy may experience drops in their perceived self-efficacy when they are tasked with doing something foreign and unfamiliar (Ashton, 1984), like delivering instruction using alternative methods during the school closures due to COVID-19. They may have been overwhelmed with the stress of new technologies and methods of instruction or personally coping with the stress of the situation. “People fear and tend to avoid threatening situations they believe exceed their coping skills” (Bandura, 1977, p.194). However, “the strength of people’s convictions in their own effectiveness is likely to affect whether they will even try to cope with given situations” (Bandura, 1977, p.193). Self-efficacy once felt in the classroom may not necessarily transfer to delivering alternative methods of instruction that involve introduction of new technologies in the learning process and greater demands on the teacher to know and use a variety of technology resources (Watson & Watson, 2007; Ashton, 1984).

Gaps in the Literature

There is only a small base of research around K-12 remote learning and an even smaller base addressing remote learning in the elementary grades (iNACOL, 2015; Oliver, Kellogg, Townsend, & Brady, 2010; Rice, 2006). Enrollment in online learning and virtual school options is “growing exponentially throughout the US” yet there is “little research on successful online

teaching in the K-12 arena” (Toppin & Toppin, 2016, p. 1574). Furthermore, the country had not previously experienced a prolonged school closure event like we saw during the COVID-19 pandemic, so there is no research with which to compare regarding the experiences of individuals in such a crisis.

Conclusion

The COVID-19 pandemic has influenced our nation with unprecedented actions and preventive measures that impacted our educational system and our typical delivery of instruction. Teachers have been asked to transform their methods of instruction to meet immediate demands of remote learning, often with little forewarning or training needed to provide such methods of instruction. Science instruction in elementary classrooms lays a vital foundation that students need to sift through the current rhetoric of information flooding our nation during this pandemic. “Never before has it been clearer that a scientifically literate populace is essential – a populace that can understand data and critically weigh evidence” (National Academies of Sciences, Engineering, and Medicine, 2020, p. ix). Yet, the disruptions to instructional processes caused by the COVID-19 pandemic have further impacted our science teaching and learning environments. In a survey of K-8 science teaching during the COVID pandemic, 88 percent of teachers indicated that their students were spending less time on science during remote learning than they had in the classroom (Iveland, Rego, Sarna, & Wolbrink, 2020).

How did teachers adapt and react to these challenges? What disruptions to learning and instruction occurred because of remote learning experience during the COVID-19 pandemic? The experiences of the teachers involved in this study will offer deeper understanding of these questions and challenges found during the COVID-19 pandemic.

Chapter 3: Research Method

Introduction

The purpose of this study was to understand the experiences of a selected group of elementary teachers who were suddenly required to design and engage in instruction remotely during the COVID-19 pandemic due to school closures. This type of educational shut-down was unprecedented, and thus little is known about how teachers will pursue and continue instruction with their students during a global crisis. A qualitative approach to this research allowed the opportunity to explore and describe several elementary teachers' experiences with school closure and delivering instruction remotely and to better understand adjustments made with elementary science instruction for the remote learning experience. This study also provided an opportunity to understand of the levels of participation and engagement from teachers, students, and parents throughout the extended school closure and remote learning period.

Research Questions

Question 1:

How did elementary science instruction in the remote learning environment during early response to the COVID-19 pandemic compare with normal or traditional classroom science instruction?

- a) How and why did elementary teachers modify science instruction for remote learning?
- b) What specific factors influenced elementary science instruction in the remote learning environment?
- c) What issues or conditions influenced elementary science instruction in the classroom as schools reopened in the fall of 2020?

Question 2:

What were elementary teachers' experiences as they pivoted from onsite classroom instruction to delivering instruction via remote methods during early response to the COVID-19 pandemic?

- a) In what ways did elementary teachers deliver instruction through remote learning?
- b) What factors influenced their experiences with remote learning?
- c) What issues or conditions influenced instruction in the classroom as they transitioned back to school in the fall of 2020?
- d) What are elementary teachers' perceptions of how this remote learning experience will influence education in the future?

Nature of the Study

Qualitative methods were used in this multiple-case study to describe the lived experiences of 10 elementary teachers who were delivering instruction remotely during extended school closure due to the COVID-19 pandemic. Data collection involved in-depth and multiple interviews to capture the experiences of selected elementary teachers during this period of extended school closure. Interviews were conducted on a weekly basis for nine weeks, starting after the first week of the remote learning experience and continuing throughout the remainder of the 2019-2020 school year. These interviews focused on their experiences each week in delivering and modifying instruction, engaging students in learning, communicating with parents and students throughout the process, and their perceptions of the involved conditions, situations, or contexts of the week. A follow-up interview was conducted in September of 2020-2021 school year to capture the experiences of the transitions back to the classroom and to understand the contexts in which they are returning.

Subjects

Subjects in this study were selected using criterion sampling, coupled with convenience sampling (Creswell, 2013). Subjects must have experienced the phenomenon and fit a particular criterion for the study (Cohen, Manion, & Morrison, 2018). Criterion for subjects of this study included: must be an elementary classroom teacher (K-5th grade) and must be delivering instruction remotely during extended school closure due to the COVID-19 pandemic. Twenty teachers were sent an invitation to participate in this study through social media avenues (Appendix B). Each teacher invited had a connection with the researcher, or a mutual connection with a friend of the researcher. This connection provided benefits during the interview process as a relationship was already established with the researcher. Subjects were selected from those interested using a process based on order of responses, grade level taught, years of experience, location of the teacher, and the subject's apparent willingness to be forthcoming in their interviews. This process helped maintain a balance in representation from kindergarten through fifth grade and provided variation in experience levels, districts and locations of teachers involved. Twelve teachers responded to the invitation to participate, and ten were selected for participation. Through the selection process, two teachers were not chosen because their school already had representation in the study.

Data Collection Instruments

Survey. A brief introductory survey (Appendix C) was completed by all teachers who expressed interest and willingness to provide details about the geographic location of the teacher, number of years taught, current grade level, initial method of instructional delivery, and an open response question concerning their greatest challenge surrounding remote learning. This demographic information was used as part of the selection process to ensure representation from

all grade levels, experience levels, and from a variety of locations. The survey responses were time-stamped, and subjects were selected in the order by which they responded and based on if that grade level needed further representation or for variation in location. The survey also served as the electronic consent form for participation in the study and consent to recording of the interviews.

Interviews. Weekly interviews were scheduled with each subject on a recurring, weekly basis and were conducted using *Zoom*. The goal of the interview was to capture the subject's experiences with remote learning each week. Semi-structured interview protocols (Appendix D) were designed to maintain consistency in gathering data in all interviews but also allowed flexibility in questioning throughout the process, thus the actual interview items included are those designed in advance and in the conduct of this study. Questions were designed to prompt subjects in sharing their lived experiences each week. Wording or sequence of the questions were tailored to individual interviewees based on their responses and prompts or probes were used as needed (Cohen, Manion, & Morrison, 2018). The researcher took notes during each interview and referred to them in preparation for subsequent interviews.

Research Procedures

The research process followed in this study is illustrated in Figure 1. The process began by initiating IRB approval for the study (Appendix A). Due to the time-sensitive nature of the study, conditional approval and supervision was provided by my committee members so the selection process could begin. Teachers were invited to participate, and 10 subjects were selected based on responses from the introductory survey that provided basic demographic information and initial perceptions on their greatest challenge with delivering remote instruction. Once participating teachers were selected, the first weekly interview was scheduled and conducted.

After all the first week's interviews were complete, a brief analysis of trends or patterns found among all the experiences was conducted. This provided information to guide future interviews and supported the building of meaning throughout (Cohen, Manion, & Morrison, 2018). A recurring, weekly schedule of interviews was established, and the subsequent weekly interviews were conducted. Following each week's interviews, a brief analysis of patterns or trends among the experiences was conducted using the researcher's notes from each interview. Weekly interview questions were adjusted as needed to follow up on any previous trends, questions, or contexts that were presented. Again, the final questions asked are included in Appendix D.

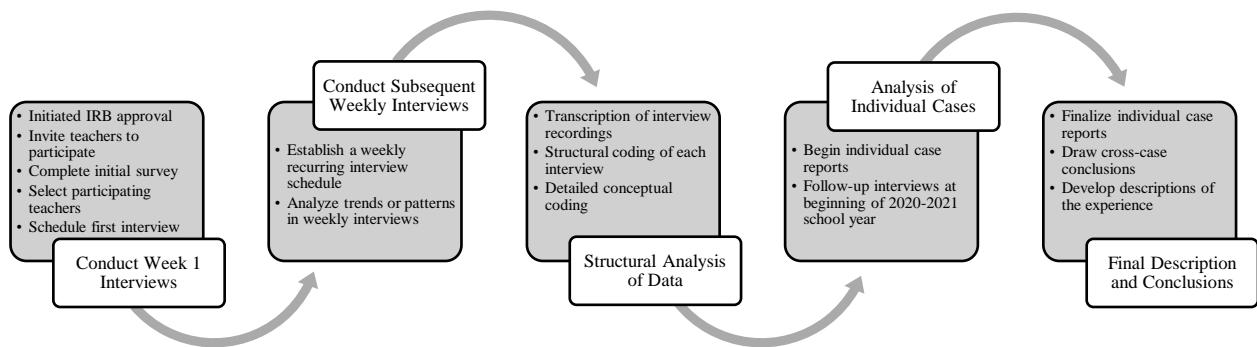


Figure 1: Flow Chart of Procedures Applied in this Study

Data analysis began with structural coding of the content related to each of the research questions and the questions used to frame the weekly interviews (Saldana, 2016). The structural codes provided a label for the larger content related segments from the interviews. After the structural coding occurred, a more detailed concept coding within each structural code was developed, providing smaller conceptual segments of data that could be examined within each case and across the cases. Figure 2 provides a summary of the structural codes and detailed conceptual codes applied to each case and across all cases.

Delivery Methods <ul style="list-style-type: none"> • Paper • Online • LMS/Platform • Videoconference • Communication 	Science Instruction <ul style="list-style-type: none"> • Lessons/activities • Resources • Adjustments 	Instruction - Other Subjects <ul style="list-style-type: none"> • Subject area (ELA, math, social studies, specials) • Resources • Adjustments • Planning 	Expectations <ul style="list-style-type: none"> • Grades/Grading • Attendance • School level • District level • State level 	Students <ul style="list-style-type: none"> • Connecting with • Engagement / participation • Participation totals • Social-emotional; well-being
Parents <ul style="list-style-type: none"> • Contact with / nature of contact • Support given • Struggles 	Teachers <ul style="list-style-type: none"> • Social-emotional; well-being • Stress/ frustration • Self-efficacy • Personal learning • Reflections • Work-home-life balance 	Support Provided <ul style="list-style-type: none"> • School level • Team level • District level • State level 	Technology <ul style="list-style-type: none"> • Accessibility • Struggles • Personal learning experiences 	Other Factors <ul style="list-style-type: none"> • Consistency / guidelines • Student welfare • Inadequacy • Academic concerns / inequity • Student motivation • Outlier

Figure 2: Structural and Conceptual Codes Applied during Analysis

In vivo coding was used to capture the participant’s voice and the meanings inherent in their experiences (Saldana, 2016). I was cognizant of the fact that meaning is embedded in practices, feelings, and cognition, and is revealed through more felt aspects of experience (Wilson, 2015). Case stories describing the experiences of the participants were written following the structure of the research questions and structural coding labels. The stories were written to capture the essence of what was experienced and how these experiences were influenced by contexts, settings, or situations (Creswell, 2013; Englander, 2012). After individual case reports were written, a member checking process was employed for subjects to review and approve their individual case report. Then a cross-case synthesis was conducted, allowing for comparison and conclusions to be drawn from the experiences.

Research Timeline

Data collection began following the first week of remote learning in late March of 2020. Weekly interviews were scheduled and conducted through the remainder of the school year. Weekly trends and patterns were analyzed following each week's interviews. A final interview in May was conducted to capture each subject's reflections on the experience. After the final interviews in May were completed, the initial data analysis began with transcription of the recorded interviews. Weekly interview data from the researcher's notes and interview transcriptions were coded and analyzed using the research questions and interview questions as a guiding framework. Individual case reports were started, and initial themes and patterns were compiled. A single follow up interview was conducted in September of the fall semester to capture subjects' experiences in transitioning to a new school year with modified procedures and protocols for instruction. Data was analyzed and compiled to develop descriptions of what was experienced and how these experiences were shaped by contexts, settings, or situations. A cross-case analysis was conducted and supported the development of conclusions and implications of the phenomenon.

Data Reduction

The data analysis occurred throughout the study, beginning with the consideration of trends and patterns found in each week's interviews. Structural coding was applied to each weekly interview transcription to segment the content related to each of the research questions and helped frame the foundation of the case reports. Detailed conceptual coding within each structural code was developed and helped provide smaller segments of data to be analyzed within each case and across the cases. Again, figure 2 provides a summary of the codes applied during analysis. In vivo coding was applied to specific statements to capture the voice of the subject and

their inherent meanings from the experiences (Saldana, 2016). These data segments and significant statements were used to write descriptions of what was experienced and how these experiences were influenced by contexts, settings, or situations (Creswell, 2013; Englander, 2012). Individual case reports were written using structural coding as a framework and the experiences were compared through a cross-case analysis to construct meaning of the overall experience with the phenomenon (Yin, 2014).

Validity and Reliability of Conclusions

This study was conducted using a multiple-case study design with converging evidence from multiple sources and multiple interviews, offering multiple measures of the experiences of elementary teachers delivering remote learning during the COVID-19 pandemic (Yin, 2014). The converging evidence offers triangulation of data and strengthens the construct validity of the case study (Yin, 2014). To provide validity to the interview results, I minimized bias as much as possible, keeping an open mind regarding preconceived notions or theories (Cohen, Manion, & Morrison, 2018; Creswell, 2013). Reliability of the study was dependent on the consistency of the data collected through the interviews and upon the subjects who responded in the weekly interviews. Their willingness to be forthcoming in the interview process was necessary to maintain reliability. Consistency in the interview process was maintained using semi-structured interview questions each week. Prompts and probes were used to clarify or seek additional information, but the general format of the questions remained intact for all subjects.

Dependability involved respondent validation, researcher notes, and member checking processes (Cohen, Manion, & Morrison, 2018). Subjects were asked to read and review their case reports to check for accurate descriptions and appropriate representation of their experiences as a way of corroborating the findings and evidence in each case (Yin, 2014). Subjects provided

comments on corrections or suggestions for change in the report. Corrections and suggested changes were reviewed, and if a disagreement on the conclusions or findings emerged, a search for further evidence was conducted and a revised report was submitted to the subject for review. Corrections through this process enhanced the accuracy of the individual case studies and increased the construct validity of the overall study (Yin, 2014). Pseudonyms were given to each subject to provide anonymity and school locations and district names were kept out of the case reports and cross-case discussions to further protect the identities of the subjects.

Chapter 4: Results – Case Study Reports

Introduction and Organization

This chapter is dedicated to the subjects in the study and their individual stories. The first section provides an overview of the subjects involved in the study and their profiles. The second section provides the individual case study reports for each of the subjects in the study. Chapter Five will provide the results of the cross-case syntheses, and Chapter Six will offer a discussion of the key findings, general conclusions, and implications gleaned from the study.

Case Study Overview

This section provides a general overview of each subject and related demographics. All subjects were elementary school teachers who were delivering instruction through remote methods during the COVID-19 pandemic in spring 2020. All ten subjects are Caucasian females who taught in public schools in either Arkansas or Texas. Each subject differed in their years of experience, ranging from a first-year teacher to having more than 30 years of experience. Six different school districts are represented, three from Arkansas and three from Texas. Two districts in Arkansas are represented by multiple subjects: ‘District 1’ has four subjects, and ‘District 2’ has two subjects. School locations range from rural areas to large cities, as classified by the National Center for Education Statistics. Each subject represents a different school with varying student demographics and enrollment. A brief profile of each subject is provided in Table 1. Subjects were assigned pseudonyms to protect their anonymity. Each district was assigned a number (district identifier) for anonymity but allows identification of the multiple representatives from two districts in Arkansas.

Table 1: Subject Profiles, March 2020

Subject	Grade Level	Years of Experience*	Campus Grade Levels	Campus Enrollment**	Campus Title 1***	State	District Identifier	Location****
Anne	K	30	K-5	548	46%	Texas	4	Town-Fringe
Hannah	K	24	K-5	541	82%	Arkansas	1	City-Small
Sherry	1st	25	K-4	457	25%	Texas	5	City-Large
Abby	2nd	1	K-4	513	45%	Arkansas	2	City-Small
Bailee	3rd	11	K-5	485	63%	Arkansas	1	City-Small
Lauren	4th	6	K-4	900	8%	Arkansas	2	City-Small
Kelly	4th	23	4-6	342	64%	Texas	6	Town-Remote
Julie	5th	32	K-5	751	11%	Arkansas	1	City-Small
Daisy	5th	21	K-5	565	79%	Arkansas	1	City-Small
Elizabeth	5th	17	4-5	730	58%	Arkansas	3	Rural-Fringe

*Experience: number of years teaching including the 2019-2020 school year.

**Enrollment: the total number of students in attendance during the 2018-2019 school year.

***Title 1: the percentage of students who are eligible to receive free or reduced lunch based on household income as determined by the federal government for the 2018-2019 school year.

***Location: the locale classification of the school district according the National Center for Education Statistics

Enrollment, Title 1, and Location data was obtained from the National Center for Education Statistics <https://nces.ed.gov/ccd/districtsearch/index.asp>

Case Study Reports

What follows is a series of stories of the individual case study subjects (Table 1) framed around the research questions for the study and the structural coding used in analysis (Figure 2). Each story begins with a background of the subject and provides context around their remote learning environment. Next, science instruction in the remote learning environment is described and compared to reports of typical classroom-based science instruction and includes a description of their science instruction in early fall 2020. Then, the subject's experiences with remote learning are discussed alongside the influencing factors of the experience, followed by reflections from the subject on the experience. Next, the subject's transition back to school in the fall is described, and the case study report concludes with their thoughts and perceptions of future implications from the experience. The case study reports are presented in grade level order, as seen in in Table 1.

Multiple technology platforms and digital learning tools were used to deliver instruction during the remote learning period and are mentioned throughout the case studies. A learning management system (LMS) provides a central location for teachers to develop content, manage and organize instructional materials, deliver instruction online, and track student progress (Palevish & Honeck, 2017; Ragan, 2009). Teachers can personalize learning content, and embedded interactive gradebooks offer teachers the means to give feedback to students while providing visibility to parents of their child's learning progress (Palevish & Honeck, 2017). Many of these systems also embed communication tools for email and direct messaging to students and parents, as well as videoconferencing options. A variety of LMS platforms were used by subjects in this study:

1. *Google Classroom* is a Google education product that allows teachers to organize their students in classes, upload documents and assignments for students, provide feedback, connect with students through the class stream page, and communicate with students and parents with messaging and email tools (Google, 2020).
2. *Schoology* is a LMS delivered by PowerSchool that integrates with a district's Student Information System (SIS) and has a central management feature to automatically design class rosters and keep gradebooks updated. *Schoology* has over 300 integrated apps to support teachers in building and delivering content. It also has integrated tools for collaboration, videoconferencing, and communicating with parents and students. Students receive updates in their class stream or through direct messages and parents can view messages in the LMS or via email (Schoology, 2020).
3. *Seesaw* is an LMS that integrates with a district's Student Information System (SIS) and has a central management feature that allows for bulk upload of class rosters and

automatic roster updates. Content is created, stored, assigned, and submitted in digital student portfolios. Teachers can share a variety of media through private messages to students and parents and with class-wide announcements (Seesaw, 2020).

Beyond the LMS, teachers in the study utilized a wide variety of digital learning tools to assist them in creating instructional content, engage students in learning activities, and communicate with students and parents remotely. Many of the subjects utilized digital tools to record instructional lessons, read alouds, or messages for the day. Digital tools such as *Screencastify* and *Loom* were used to record a subject's computer screen and their audio of the presentation. Videos were shared with students through their LMS or as hyperlinks in their weekly assignments. Teachers created interactive lessons that embedded formative assessment and student response opportunities using programs such as *Edpuzzle* and *Nearpod*. *Edpuzzle* allowed teachers to use personally created videos or videos found online or through their content library and add interactive elements for student thinking and response to learning. *Nearpod* provides a platform for teachers to convert slide presentations, PDF documents, and videos to interactive lessons with formative assessment options and gamified-style activities.

Communication and messaging tools were used by many of the subjects in the study to streamline their contact with parents. *Remind* is a mobile messaging platform that works like text messaging, allowing teachers to send messages to parents without sharing their personal phone number. *Class Dojo* is an online tool that allows teachers, students, and parents to interact in a social community environment. Their class community can connect through a social-media style news feed and with messaging features that offer language translation services as well. Videoconferencing tools, such as *Zoom* and *Google Meet*, were utilized for synchronous meetings with students in both small group and whole class formats.

1. Anne's Story of Pandemic Induced Remote Learning

Background and Context

Anne teaches kindergarten in a small Texas town. She was in her 30th year of teaching in spring 2020 and moved back to kindergarten in the 2019-2020 school year after 10 years of teaching first and third grade. Her elementary school serves kindergarten through fifth grade with an enrollment of 548 students and 46% free or reduced lunch eligibility. In her self-contained classroom, she had 16 students in spring 2020 and 19 students in fall 2020. Anne did not have any prior experience with remote learning or teaching students through virtual methods.

Her district was on Spring Break when the state began closing schools during the COVID-19 pandemic. They extended their spring break by one week and faculty began remote learning procedures on March 23, 2020. The district began their remote learning with paper packets containing three weeks' worth of work. These packets consisted of worksheets or cut and paste activities to review concepts they had addressed prior to remote learning. Planning for the three weeks of paper packets was divided up among the three elementary schools with each school pulling together worksheet type activities in each subject for one week. Anne's kindergarten team compiled activities for one week in the areas of reading, phonics, writing, mathematics, and science. They sent the work they compiled to the district office, who then copied, assembled, and mailed the packets to each student in the district.

The big push for us was to make everything consistent. So, whatever this school sent out for kindergarten, they wanted all schools to do the same thing so that our kids would have the same things, and everything would be the same for the parents. (I1)

The work in the packets was to reflect a review of concepts taught up to that point in the school year, with no new learning involved. Teachers were asked to use their assessment data from mid-year to determine skills or concepts to review in the packets. Kindergarten review work included worksheets and cut/paste activities that reviewed phonics, sight words, handwriting, basic

numeracy concepts, shapes, living and nonliving things, and classifying animals. After the initial three weeks with packets, the district transitioned to online learning using the district's learning management system, *Schoology*. District planning teams in each grade level were assembled and designed the weekly activities for the remaining remote learning period.

Science Instruction in Remote Learning Compared to Science Classroom Instruction

For the first three weeks of remote learning, students completed activities from their district-created paper packets such as: a cut/paste sorting of living and nonliving things and a cut/paste sorting of land, air, and water animals. During these three weeks, Anne started sending additional activities and ideas for parents to with their children as 'hands-on' activities at home. Using the messaging system through their LMS, *Schoology*, along with email and texts, she shared the directions, recipes, and video links to activities such as making Playdough and Oobleck, mixing colors for dyeing eggs for Easter, and going on a nature walk to look for living and nonliving things. With these activities, she also provided questions for the parents to discuss with their child during the activities, giving the parents a chance to have conversations with their child about their learning experience. In turn, parents sent pictures to her, showing the result or the child during the activity. Anne used these pictures as part of her daily messages with students and parents. She would post the picture on their *Schoology* class page news feed, comment on it, and encourage others to try it and send pictures. This practice encouraged communication with parents and students during the initial weeks of remote learning, and many parents continued this practice throughout the entire remote learning period.

The district transitioned to online learning in Week Four, with activities that had been planned by a team of district kindergarten teachers. These plans included one to two days of science activities that involved a short content video and a brief activity to complete after

viewing the video. One week they watched a video about living things and students drew a picture of a living thing. Another week they watched a video about plants as living things and then students drew a plant and labeled the parts of the plant. In the last few weeks of remote learning, the science and social studies concepts were integrated in activities about habitats, animals, and life cycles. Geography was incorporated into their learning activities with habitats, and they explored a variety of animals that lived in specific geographic locations.

Anne continued to supplement the science activities each week with additional discussion questions and opportunities to expand their experiences with the concepts at home. She shared science content videos from *BrainPOP Jr.*, an animated educational site for kids that provides content videos, activities, and resources in multiple subject areas and used lessons and activities from *Mystery Science*, a website with ready to use science lessons and videos. She sent parents a variety of experiments and activities that could be done at home and accompanied the additional activities with various websites and video links to support their experience at home. Her parents appreciated the additional *at-home* activities because they were able to make connections with their child through the experience. “So, you know, a handful of parents are taking everything, running with it, and thinking how they can expand it. So, they're finding things to tie it all together for their kid.” (I5) One week, she used her video conference time with the students to discuss living things and what they need to grow. She shared this about their discussion:

One of my big things was [that] plants need room to grow because kids always forget about that. And we made the connection:

Anne: *You don't still sleep in the baby bed. Why not?*

student: *Well, I don't have room.*

Anne: *Why?*

student: *Because I've grown.*

So, [I was] trying to make that connection for them. And then we talked about how weeds in the garden don't let the plants grow. And a couple of moms emailed back and said that they [parent & child] went out and were weeding the whole flowerbed because those flowers need to grow. The weeds don't need the room, flowers do. (I5)

Anne explained that many of the additional experiments and activities that she sent home each week were not necessarily aligned to the weekly topics of study and may not have been aligned to their grade level standards, but she included them because the activities were fun and engaging and prompted student curiosity. Two of these experiments were: *Can you poke a pencil through a bag of water without it leaking?* and *What happens to a penny when you place it in vinegar and salt?* “I think the parents are liking the hands-on science experiments and things that they can do versus watching a video and doing this short drawing or activity.” (I7)

When asked how the science instruction during remote learning compared to her on-site classroom instruction, she explained that their current curriculum doesn't have a lot of hands-on science activities, and they did not emphasize science instruction in the classroom before remote learning. “I don't feel like science was emphasized enough with the kids prior to this. And I like doing a lot of hands-on activities with the kids. I just felt like science [in the school curricula] was kind of an afterthought.” (I9) Anne explained that the 2019-2020 school year was difficult because it was her first year in this district, her first year back in kindergarten after 10 years, and she struggled to learn all the nuances of the district and curriculum this year.

I was trying to get a grasp on the new reading and phonics curriculum because that was more important than the science. I just felt like science and social studies kind of got pushed to the wayside. And it wasn't what it needed to be. So, that was going to be my summer 'what can I do to make my classroom better' project. Pulling out some of those hands-on activities and those little things that take 15-20 minutes. Even if I just did a science day or Mad Science Friday activity with the kids for next year. But this year, I just found it very lacking. (I8)

Anne's efforts with using *Schoology* and her supplemental science activities during the remote learning earned her a spot on the district science planning team for kindergarten for the upcoming school year. Teams met prior to school starting to create baseline plans that could be used consistently across the district in both their onsite classrooms and their online virtual learning classes. Plans were created using a scope and sequence given by the district curriculum department that had paced the science standards and topics throughout the year. Science activities were designed based on these standards and topics and were integrated with Social Studies concepts as often as possible. The district has baseline plans outlined for the first semester of kindergarten that include a daily science activity that takes approximately 15-20 minutes. These activities involve reading books, watching videos, class discussions, observations, hands-on activities, as well as paper/pencil and cut/paste activities.

With these district-wide plans, Anne was able to begin daily science instruction as they transitioned back to school in the fall. They began by making a science notebook and drawing themselves as scientists. They focused the first week on making observations as scientists. They went outside and captured observations of what they saw, heard, felt, and smelled and recorded these observations in their science notebooks. They made and recorded observations of what they heard, saw, smelled, felt, and tasted when they popped popcorn in the classroom. The second week focused on what scientists do, the tools they use, and safety rules. Students explored the idea of tools versus toys and how to follow science rules. The third week focused on the season of Summer. Students graphed the weather conditions and discussed relevant weather conditions, especially tornadoes and hurricanes, as they were experiencing both of those. They will move into the changing of the seasons and explore fall in the upcoming weeks.

Anne explained that she is enhancing the baseline science plans in her classroom and utilizing additional time from other areas of her instructional day to do more than what is expected. She is providing more science instruction this year than she did last year in the classroom. She also expressed appreciation for the integration of science and social studies when it's applicable.

In reality, science and social studies always gets pushed to the backside, and you might not be able to do it every day. But the way it's kind of integrated, it works together to where, if you know what you're doing, you can make it seamlessly flow. And that's what I'm doing, and the kids don't even realize it. I know they're getting a lot more science [this year]. (I10)

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

With an extended Spring Break granted by the state of the Texas, Anne's district used the extension to prepare the first three weeks of remote learning work. Remote learning during those first three weeks was delivered through paper packets that were mailed to each student. These packets included activities that would allow students to review concepts introduced prior to the onset of the remote learning. The packets were designed so that students across the district within a given grade level would receive the same activities. Packets included between four and five activities a day for each week and could not total more than 120 pages. Student supplies from classrooms were gathered by each teacher and were distributed to parents and students at specific times during the first week so that students had the necessary means to complete their work. In Week Four, the district transitioned to online learning using *Schoology*. As an LMS, *Schoology* offers them a way to manage their classes, assignments, grades, attendance, and hold video conferencing through embedded app services. While the district had implemented *Schoology* as

their LMS, it was not being used uniformly across the district when they began remote learning. The district offered virtual professional development on the use of this LMS during the first three weeks so that teachers would be able to transition to online learning using this system. Anne had not used *Schoology* with her students, so she spent time learning the features of the system during the first three weeks of the remote learning period.

During the first week of remote learning, a survey was sent out to parents regarding their access to internet and digital devices. The results of this survey helped the district to know who would need to check out a device, and how many would not have the means to participate in the online learning due to lack of internet. Anne shared because they were a smaller, more rural type town, there were a few students for whom internet was not an option at home. It was determined that they would send paper packets to those few students. Anne had one student that received the paper packet throughout the entire remote learning period.

Communication with Parents: Issues and Opportunities

The district established the expectation that the teachers would be accessible to parents and students between the hours of 8:00am to 4:00pm each day and would respond within 24 hours to any communication from parents or students. This teacher schedule was set to maintain consistency across the district. Communication during the remote learning took many forms: emails, texts, phone calls, and messages through *Schoology*. Teachers were expected to communicate with parents at least three times each week. Anne set up a Google Voice system for her phone calls and texts. This system allowed her to keep her personal phone number hidden, while being readily available for communication with her parents and students. It also allowed her to keep a record of all text messages for accountability purposes. Knowing that some parents

were still working at this time, Anne responded to several texts or emails in the evenings out of respect for the working parents' schedules.

Maintaining a strong relationship with parents was important to Anne as evidenced by her responses. She worked hard to respond to questions, concerns, and even received several compliments from parents. There was much more communication in the beginning, as parents needed assurances about what their child was doing and how they should support them. Her communication to parents remained constant through the remote learning period, sharing at least one or two messages or reminders each day, more than the district expectation. She received a higher volume of communication from parents during the start of remote learning and during the transition to online learning with *Schoology*. In Week Four, most of the messages from parents were related to the technology and use of *Schoology*. Anne admits technology is not her forte, but she was quick to jump in and learn about the features of *Schoology* and how to best use it with her students.

This week, [Week 4] I was feeling pretty pumped about myself technology wise because this is not my forte. I just taught a parent how to scan with her iPhone. It's scary how much technology I have had to learn in the past few weeks! (I4)

Anne believes this experience helped her strengthen relationships with the parents. "I think this process has helped build a better relationship with parents. I think they're more comfortable with saying I don't understand versus just sitting there and not saying anything when they did not understand something." (I3) Anne maintained communication with 15 out of 16 of her students' parents or caregivers through the nine-week period.

Starting in Week Five, many of the parents were saying they did not know how she did this all day long and they were struggling to do this with their child all day. Anne often remarked that she felt like she was doing a lot of Parenting 101.

I think the parents have gotten to see a whole new side of their children that they've never seen before. I kind of I feel like I'm counselor a lot because you have to put this in perspective...but I feel like I'm doing a lot of parenting one on one, which I kind of feel like that's what I do a lot in parent conferences as well. But especially this week [Week 7]. (I7)

Anne hopes “that parents will come out of this experience with a new perspective on the work teachers do and have greater empathy for teachers in general.” (I9)

Student Engagement and Participation during Remote Learning

Anne took advantage of the first three weeks of remote learning with the paper packets and began to play around with *Schoology*, learning more about its features and trying them out with her students. She explored the class news feed feature by posting daily messages to the class and commenting with the students. Along with phone calls and text messages, Anne started using the *Schoology* messaging and class posting system to share ideas and activities for kids to do at home. She encouraged them to send her pictures of them doing the activity or with the finished result. When she received these photos, she would post them on their *Schoology* class page, which is like the social media Facebook app. All her students could see the pictures and comments about them.

Another feature Anne started exploring was the *Schoology* conferences app which allowed her to host video conferences with her students. Week One’s video conference was solely focused on allowing the students to see each other and chat while she explored the various components of the app. Eleven students participated in this first video conference. During Week

Two, she hosted a special video conference time for the girls in her class while she continued to explore the features of the app. In Week Three, she had 13 out of 16 students join her for a scheduled video conference and nine out of 16 joined her on a spontaneous video conference later that week. “The kids just wanted to talk to each other. They are so happy to see each other.” (I3) She also explained that she was finding it difficult to do instruction with them on the video conferences. “The conferencing is a hot mess right now. I can’t do lessons or instruction with them. I have to teach them what to do and to stop talking over each other” (I3)

Week Four brought the start of online learning across the district. Anne decided to try meeting with smaller groups of students for instructional video conferences, as well as whole class chat sessions to help them get their social-emotional needs met. She shared she had good participation and engagement with her smaller group video conferences on Monday. Her principal started popping in to see the students during their social-emotional chat times. The kids really liked seeing him.

Anne continued to hold small group instructional video conferences each week through the remainder of the remote learning period. While some weeks were harder than others, and she often felt like she was “herding cats”, she knew these calls were important to maintain student participation and engagement throughout the process. (I5) She also shared that several parents attend the video conferences with their child to support them and know what is occurring. Student participation in these conferences held steady throughout the remote learning period, averaging 12 students each week. She did see a slight drop in participation starting in Week Seven and explained, “everyone is just tired...they’re tired of doing this and they’re doing the minimum required.” (I8)

Anne saw consistent participation in student work throughout the spring remote learning period, having only one student who did not submit any assignments during remote learning. Packets from the first three weeks were returned to a drop-off location at school. Once these were received, students were given participation and attendance credit for those three weeks. As the online learning began in Week Four, the students were expected to submit at least three assignments each week from their reading, phonics, or mathematics assignments. Participation in a video conference counted as one of their weekly assignments. Anne attributes the consistent participation and submission of student work to her communication and relationship she built with the parents prior to and throughout the remote learning period. Parents complimented her on her presence with the kids and her flexibility throughout all the changes.

One mother said to me, “you're so calm and nothing seems to faze you. You just kind of roll with the flow. I've seen you take a deep breath or pause. But you don't get upset with the kids, and I'm so glad that I've gotten to see that.” I told her I hope it lets her into the life of a teacher and you see what we deal with. Some days are easy, and some days are not. (I5)

Administrative Expectations and Support Provided during Remote Learning

Anne often remarked that her superintendent was very supportive, even before the remote learning experience. She shared that he visited each campus during their paper packet and supply distribution in Week One and that he genuinely cared for each of the teachers and students in the district. He wanted consistency across the district in everything they did during the remote learning period. She also shared he did not make decisions lightly and gathered input from all campuses before finalizing a decision or process. “I'm very lucky to be with a district that is so teacher oriented. They want to do what's best for us and to make it easy on us; make it a little better for us.” (I9)

The district started the remote learning experience by establishing a set schedule for all its teachers. Teachers were expected to be accessible from the hours of 8:00am to 4:00pm each day and respond to any communication within 24 hours of receipt. Student attendance was determined by completion and return of the paper packets for the first three weeks, and then with submission of at least three assignments a week for the remainder of the remote learning period. No new instruction was to be delivered during the remote learning period. Teachers were to use their mid-year assessment data to determine concepts and skills needing mastery and use those as their focus for review instruction. As a kindergarten teacher, Anne did not have to worry about taking grades, as they use a learning portfolio system, that includes student work samples and assessment data. She shared her portfolios were up to date, with exception of end-of-year assessments, which would not be administered this year, per state mandate due to the remote learning experience.

Anne's principal was also supportive and responsive to their concerns and needs throughout this experience. He provided his support and assistance with contacting parents when the teachers were not able to reach them and gave Anne additional assistance with a child's parents that were very upset about an end-of-year recommendation for summer school. He also saw the positive attitude Anne kept throughout the experience and promoted her tenacity to learn *Schoology* and try it out with her students in a school-wide video conference. Her teammates were also a huge support during this experience. "Everybody watches out for each other." (I2) They met weekly, via video conference, to plan and stay updated with each other.

Issues and Personal Learning Experiences with Technology

The district opted to move from paper packets to online learning delivered through *Schoology*. The district had not placed an emphasis on using *Schoology* as their sole platform prior to the remote learning period, however, the district requested teachers use this platform starting in Week Four of their remote learning. The district provided virtual professional development on Wednesdays to support the teachers in their understanding and use of *Schoology*. Anne had not really used technology in her classroom prior to this experience because of her focus on the students' fine motor skills. Learning to use *Schoology* was a new experience for her, and she was "glad she saw the writing on the wall". "This is one of those times where I listened, and I caught *Schoology* is what we're doing. So, I did not do anything else." (I4) She expressed her relief in learning *Schoology* and using it in those first few weeks because "those teachers that were using *Google Classroom*, *Flipgrid*, *Seesaw*, and all that other stuff are having to change. So, their parents are having major difficulties transitioning, too." (I4)

Anne often laughed and remarked about how much new learning she was doing with technology. "An old dog learned a new trick: I can do video conferencing with my kids through *Schoology*." Anne used the first three weeks of the remote learning period to study, explore, and practice with the components and features in *Schoology*. In Week Two, Anne shared that she was becoming more familiar with the layout of *Schoology* and felt better about her use technology. She was even labeled a 'tech expert' in a school-wide meeting, which she said was a "big deal".

It's pretty sad when I'm considered an expert on any technology. At the all-school conference, they shared that I, the kindergarten teacher, had done a *Schoology* video conference. A lot of people are really scared of it, and I'm like, 'guys just jump in and do it and go!' (I2)

In Week Four, she shared that the more she was using the program, the more features she was finding and that it was becoming more user friendly. She also started seeing ways that she could utilize *Schoology*, not only with the students in her classroom, but also for reporting out and in communicating with the parents.

But the more I keep digging through *Schoology*, the more things that I'm finding. I'm seeing instead of sending home that reading log for the week or month, that gets all nasty, that now I can set that up on *Schoology*, so they would just type something in and submit it. (I5)

The implementation of *Schoology* as a consistent platform across the district created stress and confusion for many at the beginning of the online learning period. Anne said the Monday of Week Four she had “lots of fires to put out; lots of parent questions and stress related to the *Schoology* roll out.” However, after the initial transition, many saw the benefits of the consistent platform and how it could be used in the future. Anne said, “the district is using what we are doing in kindergarten through *Schoology* as an example for other teachers in their use of *Schoology*.” Anne also explained, “this is a great time to explore how to use this [*Schoology*], and if it blows up its no problem because everyone has grace right now.” One of the features Anne shared that she appreciated about *Schoology* is that it gives her evidence of participation. “It shows me when they [students] have watched the video, opened documents, submitted things, etc. So, I have proof they are doing things.”

Other Factors Influencing the Remote Learning Experience

It was often hard to find that balance between being at home and being at school or work. Anne expressed feeling “chained to the electronics” (I2) and feeling as if she were on the clock 24 hours, seven days a week.

The struggle this week has been that I can't get away from school. It's 24/7. You know, the computer's right there on the table. I can't walk away from it. Whereas at school, you stay late on Thursday or Friday and you get everything done. You shuffle stuff around and get everything laid out for Monday on Friday, and then you shoot out of there. And you don't think about it. Well, that's not the luxury now. It's invaded your home; it's invaded your space; and it's hard to sever that tie. So, I think I'm kind of in a funk right now because this has taken over my life. (I6)

It was hard to take time for herself and not feel guilty for doing so. "I had to take a step back on Thursday and take care of me." (I4). She tried to get things done when she can, even folding laundry during faculty zoom calls. She tried to stop at 4:00pm each day and tried to stay offline during the weekends. "I share with the parents that I am signing off on Friday afternoon and will see them again on Monday morning." (I3) She was glad she did not have any little kids at home during this experience, as it was just her and her husband and they were both self-sufficient. She couldn't imagine having to "be a mom" during all this too. (I6)

Anne said that finding a balance was also difficult because nothing was consistent. She struggled to create a routine or a "new norm" because everything kept changing. "Nothing is consistent, and my concrete-sequential personality is struggling with that." (I3)

The situation kept changing. We would get directives; we would start planning and moving forward and before you could even get it out. Nope, three things have changed again. And so, it was frustrating for me being the concrete-sequential, you know, I like it organized, and it wasn't organized. But it wasn't anybody's fault. It was just the nature of the beast, but I don't like flying by the seat of my pants. (I9)

Anne repeatedly expressed concerns and admitted she worried about her students and how they were doing. Anne had two students involved in active Child Protective Services (CPS) cases and was very concerned about their well-being during the shift to remote learning.

I worry, my teacher's heart, I worry about my kids 24/7. And I do have a couple that I worry about more so now because I can't see them. I don't get to see them, to see if I need to intervene or something, and that's bothering me. (I3)

She explained this was one of the reasons she held the weekly video conferences that were solely focused on the social-emotional needs of the students. Allowing them to see each other and just talk helped her see them in their environment. “Looks can be deceiving and there is a lot more chaos at homes than I realized. School is the calm and stability for these kids, and they did not get that [during remote learning].” (I9) She saw how “truly chaotic their lives were away from school. The loss of structure and routine has impacted them.” (I7) She even laughed and said she had to tell a student to put a shirt on during a video conference. “You know, I’m going to write that down on my ‘things I never thought I would have to tell a student to do’ list...put shirt on!” (I7)

Anne’s Reflections on the Remote Learning Experience

While the experience may have been daunting, exhausting, and frustrating at times, Anne often said she “was trying to find the silver linings.” (I3) She saw a lot of positive benefits for parents during this experience. “Parents are seeing what the teacher works with in the normal setting and I hope this creates more empathy for teachers.” (I5) The parents got to see the relationship she had with their child and how much she cares for each of them. One of the highlights of the experience was seeing the parents develop stronger interactions with their child. “The parents got to see things and got light bulb moments. They got to see things they can do at home and the language they could use with their child.” (I9) Parents were able to see the feedback loop and questioning techniques she used with the students and this helped the parents to interact on deeper levels with their children. She also worked hard to create home-school learning connections in her communication with parents. “I hope parents are walking away with the idea that they have to be invested in their child’s learning.” (I9)

The thing I probably am the most proud of doing during this remote learning is trying to keep the learning connected with the parents. I've had several parents make the comment that they did not realize how many little things they could do at home that would be a big impact.

One of Anne's biggest obstacles during the experience was the feeling of inadequacy and that she wasn't doing enough for her students. Even though she felt like she knew her students better because of the remote learning experience, she wasn't getting the same daily interaction with all of them. She couldn't physically see them to know if they were ok or not. This was a source of anxiety for her throughout the remote learning experience.

Anne did not feel prepared to administer instruction through remote learning methods. While the district had *Schoology* in place, she wasn't using it with her students or parents.

I wish I'd known more about *Schoology*. I do know more about *Schoology* now. I do appreciate the fact that they did push us, and that was the only way we could go. I think it helped parents because it was all in one place, everything was right there.

Anne also commented that she did not think everything should have been digitized: "I feel like maybe some of our stuff shouldn't have been online, it should have been more paper-pencil oriented for them: paper, pencil, cutting and pasting and that kind of thing." She expressed concerns with screen time, and that her students, being younger, needed the opportunity for play and for fine-motor development. She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Set the expectations up front. Give us clear cut rules and boundaries.
- Get our students and parents on *Schoology* earlier. Maybe do a reading log through *Schoology* instead of on paper to help them get used to the platform.
- Get some of our classroom routines recorded on video and have them ready to post to keep some structure going.
- Getting all the resources for students ready ahead of time. Students need to know their login information for all their programs.
- Encourage parents to stock up on school supplies in August, since they are cheaper then.

- Include *Schoology* training during our school registration event to help get everyone in the system and connected to the groups they need.

Anne did not feel the remote learning experience in spring 2020 was effective for her students. She believes there will be a backslide in social and interpersonal skills and is concerned her students will not be ready to go to first grade. “The loss of structure and routine has thrown everyone off.” (I7) “School is an important part of our lives. This showed us the importance of the classroom and all the work we do with the kids.” (I9) However, she does believe this experience was effective in other means. She sees the relationships that her parents developed with their children along the way. She also believes it’s going to help the teachers get back to the basics of “What do I really need to do here? What do students really need to learn? I think it’s going to make us cut out some of the fluff and stuff.” (I9) It’s made her refocus in a couple of areas, and it’s helped the district see ways it needs to improve too. “The district is making some curricular changes after seeing us planning together and seeing needs arise.” (I9) Her district and school are already discussing ways to implement *Schoology* more effectively in the upcoming school year.

As she reflected on the remote learning experience in the spring, she was glad to know that she “can still do this. I still instinctively know what to do with my students.” (I9) Even though “the situation kept changing” and she “did not like flying by the seat of her pants” she felt like they did a good job.

We pulled it off. I think we did a great job of staying calm. We looked like ducks. We were paddling furiously under that water, but we were gliding, and we had our ducklings in a row, and we were getting there, and we made it across. For what we were given, and within the timelines, I feel like we did a great job. (I9)

Transition Back to School in Fall 2020

Anne's district opened their doors both on-site and virtually in August 2020. School was initially slated to begin on August 17th, with teachers returning for professional development on August 10th. However, during the week of teacher professional development, the decision was made to push the student start date back one week, making the new start date August 26th. Teachers used this additional week for planning instruction through the end of the first semester. First quarter plans had already been developed by district grade level teams prior to school starting, so the teachers worked together to plan for the second quarter. Lessons were designed to provide options for both on-site and virtual instruction. The district also extended their school instructional day by 20 minutes, adding the equivalent of 10 school days to their calendar.

The district continues to use *Schoology* as their consistent platform this year, housing curriculum resources, instructional lesson plans, parent communication, and student participation in one central location. Anne shared that the Texas Education Agency (TEA) is providing access to *Schoology* for school districts across the state. She is excited that they have used the platform already, stating "I feel like we have a better game plan and handle on things than other districts in the area." (I10) The district was planning to go one-to-one with their technology this year, however an influx of new students has impacted that plan. The district ensured that students who were registered for virtual learning had the technology they needed first. Anne has laptops for each of her students and they will eventually go back and forth (home to school) with the students after they have finished their initial assessments that are given online.

The district recognized that the virtual learning in the fall needed to look different from what they did in the spring. "We knew it had to look a lot different than it did back in the spring.

And parents needed to see that what they saw in the spring was not teaching...that was a band aid.” (I10) The online learning is more rigorous and looks more like what they are doing in the on-site classrooms each day. The virtual learning classes have lessons in each subject, every day, with their specials (PE, Music, Art) providing lessons once a week. The virtual learning students are required to participate in a morning meeting that offers them social-emotional learning experiences. Kindergarten through 2nd grade students have an asynchronous experience and must submit a specific assignment each day by midnight. Third through 5th grade students have a synchronous experience with scheduled meetings throughout their day that they must attend to be counted present that day. Both the on-site and virtual teachers are using the same ‘baseline’ lesson plans so they can pivot if necessary. Teachers can add to the baseline plans, but they must follow the scope and sequence set forth in these plans. Several parents have moved their child from online learning to the on-site classroom because of this focused change. The parents and students were expecting an experience like the spring remote learning, and it was more work than they expected to do.

Going back to the classroom has not been an easy experience. Anne explained that each grade level was given a district-wide schedule for instruction. Kindergarten does their literacy block in the morning before lunch, which is about two and half hours. After lunch and recess, they have an hour for mathematics and then go to specials. They return from specials and have what is called “Coyote time” which is their intervention, small group instruction, and center time. Then they have about 50 minutes for science and social studies. They are required to wipe down their classroom at least twice a day as well.

It's hard. You're running on your feet all day. I'm on the go from 7:15 until 4:00. We're wiping and swiping as much as we possibly can, and they are sanitizing one half of the building one day, and the other half on the next day.

She has also noticed big gaps with the students and their ability to socialize and function in society.

They've had no structure for six months and are like feral kids who don't know how to sit and eat, and they have trouble going to the bathroom. Socialization is scary as they don't know how to interact, play, or problem solve with each other.

While they do have small group time and are able to work in pairs, the sharing of materials and working in groups requires a lot of rules and procedures. Their counselors have been very helpful in providing social-emotional lessons for them to use in their classes, too.

Anne's Perceptions of Future Implications from this Experience

Anne believed that the spring remote learning experience gave parents a different perspective on homeschooling and virtual school options. Anne said she's seeing more parents "buy-in to the idea of homeschooling and virtual school now. Parents are removing their kids from the public schools and homeschooling them or enrolling them in online charter schools." (I10) She also noted that they have lost the presence of their parent volunteers in school this year. Safety restrictions won't allow visitors, so the volunteer organizations, like the Parent/Teacher Association, aren't functioning in the same manner either. We can't do fundraisers, so where will we get the additional money we're used to receiving. She also mentions the loss of a lot of the "traditions in schools" like band competitions, various sports activities, extra-curricular activities, and fine arts programs. (I10) While she doesn't see as big of an impact made in the elementary schools, she does believe the older students will be impacted more with these restrictions and the loss of these activities.

Anne said the transition back to school has been "exhausting". (I10) They spend most of their time in the classroom with the students due to safety restrictions, while also cleaning and

sanitizing throughout day. “We are still expected to do all our normal duties and responsibilities during the day, attend PLC meetings, data meetings, team meetings, and we’re not getting our planning time or any down time.” (I10) Anne believes this experience is going to be the source for a lot of teacher burnout, with many teachers leaving the profession.

I think you're fixing to see a major teacher shortage. It's hard. It's tiring. I'm glad I'm in the position that I come home to the dog and the husband. They're pretty much self-sufficient. I don't have to cook supper or have a baseball practice to get to, nor do I have a little one at home. I don't have to be a mom when I come home. I think you're going to have a lot of burnout and have a lot of people leave the profession. I think that's going to be the trend. (I10)

2. Hannah's Story of Pandemic Induced Remote Learning

Background and Context

Hannah taught kindergarten in a district located in a small city in Arkansas. Her elementary school serves kindergarten through fifth grade with an enrollment of 541 students and 82% free or reduced lunch eligibility. Hannah had been teaching for 24 years, and she had 18 students in Spring of 2020. She did not have prior experience delivering instruction remotely, but she is currently enrolled in an online Master of Education in Educational Technology program with a local university and often made connections to her course work as she reflected in the weekly interviews.

Her district began preparations for the possibility of remote learning the week of March 9th, asking teachers to have 10 days of Alternate Methods of Instruction (AMI) work ready in case they went remote. Remote learning procedures began on Monday, March 16, 2020. The district allowed the teachers and schools to choose their delivery methods, with some schools opting for all digital, some opting for all paper packets, and some doing a combination of both. Her principal asked them to plan their online learning in the manner of their choice. While the popular platform at her campus was *Google Classroom*, Hannah's team decided to use *Nearpod*, an online platform that assists teachers in creating interactive lessons that can be used online with synchronous participation or as self-paced learning. Hannah had already been using this platform with her students and felt the other kindergarten teachers would have an easier time introducing this to their students than *Google Classroom*. With *Nearpod*, they created slide decks for their daily learning that included videos, online reading activities and interactive books, open response question and answers, games, and other interactive activities related to their topics.

After the first two weeks of remote learning, Hannah's principal informed them they would be transitioning to a different method for remote learning in the coming weeks. Hannah's team had already planned for the next 10 days of remote learning, so this new method would begin in Week Five for kindergarten students. The new method involved creating a weekly menu, or calendar of events, that was emailed to parents or distributed to parents through the front office as needed. There was a literacy, mathematics, and science section for each day that contained simple activities that could be done at home and did not require student access to the internet.

Science Instruction in Remote Learning Compared to Science Classroom Instruction

Science instruction during remote learning was focused on student engagement in science activities, either through interactive lessons in *Nearpod* or with demonstrations and experiments delivered by the teacher through live *Google Meet* videoconference sessions each week. Hannah had used *Nearpod* with her students, prior to remote learning, to deliver their science and social studies lessons during their literacy stations, so the kids were familiar with this structure. When they planned for the initial 10 days of remote learning, Hannah was thoughtful about the concepts they included, ensuring students could do them at home. She explored the internet, finding videos, songs, picture books, and activities that students could do at home with their parents. She did not want the activities to cost money and tried to find activities with items they would have at home. They reviewed weather concepts and how to stay safe during severe weather. They make rain gauges, pinwheels, created rain in a jar, simulated an earthquake, and learned about hurricanes. These activities aligned to their science standards about Earth Systems and observations of weather conditions. "I worked hard to connect the activities and read aloud each week in a meaningful way." (I3)

The *Nearpod* lessons they created were different from the activities that were sent home in the paper packets for those without internet access. The paper packets contained a weather graphing activity for each day and some questions about the graph. Hannah felt the paper packets were “crummy and just thrown together. They were basically, ‘let's find an activity sheet and play at home’ because we had one day to get it together and get it printed.” (I1) She hated that the paper packets did not include the same type of activities, but there wasn’t much she could do at that point. Hannah tried to make the online science lessons “more friendly to students, adding projects for them to do that would involve the family.” (I3) She wanted to be sure they were getting something that resembled learning but did not place any added stress on the parents. “I really feel like I have created something that my kids are going to enjoy. I mean, it doesn't replace me. But I tried to make it to where their parent would not be too stressed.” (I1)

The tides turned at the end of Week Two when Hannah found out they were changing how the remote learning would be delivered. Her principal explained their campus would be transitioning to a menu-type method that would give all the weekly lessons on one page for each grade level. Each day would have one activity for literacy, mathematics, and science. These activities were to be simple activities that could be done at home. For example: read a book with your parents; count to 100; take a nature walk, note what you see, hear, smell, feel. Hannah felt this was “dummying down what I’m doing, and I want my kids to learn.” (I3) Hannah went with the change because that’s what she was asked to do, but she was determined to keep her kids engaged in learning. So, she decided to start sharing content-based activities emersed with the social-emotional engagement in her videoconferences throughout the week.

I thought, let's try to find some things that are fun. Give them a chance to talk a little bit and then let's do something fun. And that's what I did. They were so excited! They thought it was the best thing in the world. (I4)

Science Wednesdays began in Week Four and continued throughout the remainder of the remote learning experience. Hannah would do an experiment live in her *Google Meet* and then share the directions and any supplemental materials with the students afterwards. She had several students send her pictures of them doing the experiments at home, which was a delight! Some of the experiments she conducted involved: making rain in a jar, making a salt volcano, making elephant toothpaste, creating a lava lamp, and creating an M&M rainbow in milk.

When asked how the science instruction during remote learning compared to her on-site classroom instruction, she explained that she did not have a lot of instructional time for science in the classroom due to district literacy and mathematics curriculum requirements.

We did not get to do much science instruction, which really broke my heart this year. But if we did get to it, usually I threw in a Discovery Ed kind of video or something. It was not a lot of hands on science this year. (I8)

She compensated for the lack of science instructional time by incorporating science into students' literacy workstation time when she could.

Since we really don't have a lot of time to do science and social studies due to district requirements in literacy and mathematics, I would put science and social studies activities in *Nearpod* for my kids to do during station time. They loved it. But I just felt like I was throwing it in there. (I1)

When they started using *Nearpod* at the beginning of remote learning, Hannah shared, "I feel like I'm actually doing lessons." (I1) *Nearpod* allows students to interact with the lesson through a whole-class format or a self-paced format. The self-paced format was perfect for the remote learning and Hannah started thinking about all the ways she could better utilize this in her classroom. She videoed herself doing some of the experiments and linked them in *Nearpod*, along with videos from *Sid the Science Kid*, *Discovery Education*, and other videos found online. She read books to her students on the topics and included links to the books if they could be found online, too. Hannah took advantage of the opportunity to incorporate more science

activities in the remote learning and said, “this is what we missed this year in science. So, this is a blessing in a way, because we're actually getting to do some of the science things that we had wanted to do but did not have the time.” (I4) She also shared that the parents were appreciative of these activities as, “it kind of gives them a little bit of a fun break.” (I4)

Hannah’s fall instructional practices have benefitted from her experiences during remote learning in the spring. Hannah teaches kindergarten virtually this year through their district’s virtual elementary school. The virtual learning experience this fall is different from that in the spring and they have dedicated lessons for science. She was so excited exclaiming, “we actually get to do science!” (I10) She worked alongside another virtual teacher to plan the science and social studies lessons. They tried to use *Discovery Education*, the district’s adopted curricular resource, at the beginning of the fall, but found assigning lessons through the *Discovery Education* platform to be cumbersome for kindergartners. After some brainstorming with her partner teacher, they decided to try to record themselves walking through a student lesson in *Discovery Education*, much like they would do in the classroom, and have students interact with the recording of the lesson rather than within the *Discovery Education* platform. Students would watch the video then record their thinking, observations, or responses in a notebook at home. When asked how she knows if they are doing their science work, since nothing is formally submitted, she replied, “most of the time, they'll take a picture and send it to me. But I can't make them do it. We just cross our fingers that they'll give us something.” (I10) Hannah expressed her concerns and struggles with using *Discovery Education* to their principal and was given permission to supplement their science instruction online with other activities that they have previously used or found online.

Students have engaged in activities around living things, their needs, and how living things can change their environments to meet their needs. Students participated in a STEM activity where they were to design a habitat that would be safe for an egg. She shared how several of the parents gave their students a real egg to test the habitat and “the parents loved this science lesson.” (I10).

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

Hannah’s district allowed choice in their remote learning delivery methods. Her principal allowed each team to determine how they wanted to deliver learning online and asked them to have 10 days prepared in case they moved to a remote learning situation. Hannah’s team decided to use *Nearpod* as their online learning platform since Hannah had been using this program with her students prior to school closure. *Nearpod* provides analytics that show if students have been in the lesson and completed the lesson. This provided evidence for them to use for attendance or participation during remote learning. Hannah had 13 out of 18 students using the online method, while one of her teammates only had two out of 19 students working online.

Not all their parents had access to internet for this experience, so they created paper packets, at the request of their principal, and distributed these to parents for the first four weeks. The paper packets did not align to the work being done online and included a lot of worksheets, or what Hannah called “busy work.” (I1) Hannah explained that she tried to make the second set of paper packets more equitable to the online learning:

I tried to make the paper packet resemble the *Nearpod* lessons so that these kids were still getting the experiments and the social studies lessons and things like that. So, it's just

basically a printed off version of it. So, no, they don't get the interactive stories and no, they don't get the interactive videos, which is kind of sad, but at least they're still getting the paper part where they can do the fun activity. (I2)

At the end of Week Two, their principal shared updates from a district meeting and informed them they would be transitioning to a new delivery method over the next two weeks. He explained the new method would be like a daily menu or calendar of activities that would include one literacy activity, one mathematics activity, and one science activity each day. It would be designed for parents to initial as each day's activities were completed. Hannah was under the impression that this change was occurring district wide, which made her question why the district curriculum department wasn't creating these for them, stating "if this is what they want, then why isn't somebody at the district creating this? We're still not going to equitable, because other schools' menus are still going to look different from our menus." (I3) This change was very frustrating for Hannah, as she had spent time creating the online lessons for her team and had almost 100% participation from her students who were doing the online method. Hannah expressed her frustrations saying,

Somebody higher up said, *we want it to be easier for everybody* and I'm thinking, *but our kids were doing it and they were doing fine*. So now you're asking us to dumb it down? I mean, I know that's bad to say, but that's what is happening. (I3)

Hannah explained the menu would be created in a document and they would share the link to the document with the parents for the students doing the online learning.

They can click a link I send to them and it takes them basically to what the paper menu would look like. For like the science activity, it just it says, *Go outside. What do you smell? What do you see? What do you hear?* For Math, it might be *count to 100 by one's* or *count backward to zero from 30*. So, I guess it makes it easier because we don't have to go plan and create *Nearpod* lessons or whatever, and then go and recreate something for the paper. But all that we've been doing is now wiped away for the rest of the year. (I3)

Communication with Parents: Issues and Opportunities

Hannah used several methods to communicate with parents during the remote learning period: email, text, and *Remind*, a messaging application. She was already using these methods to communicate with parents prior to remote learning and continued with these for familiarity. She sent daily messages each morning that would give a quick summary about the day or any new adjustments they needed to know. She also sent her reminders about their class *Google Meets* and updated parents on her available hours each day.

The first few weeks she had a lot of daily interaction with parents, some with questions about their learning expectations and others sharing exciting things they'd been doing at home. She was very concerned about how her parents would take the news about the transition to activity menus since her students were enjoying the virtual learning experience with *Nearpod*. The students were already familiar with the program, and in her mind, it gave parents a break since it was self-paced. Students would log in, start the lesson, and follow along in the lesson until they were done. Very little parent assistance was needed with the *Nearpod* lessons.

I mean, if I had a little one, I would want a break. I think that's one of the things that kind of disappointed me when they told us that yesterday about having to switch over. I was thinking, *my parents will not be very happy*. With *Nearpod*, once they figured it out, basically the kids put their headphones on or you put them in a room, and boom, they're done. The parents did not have to do anything other than with the science experiments, they'd have to help them a little bit with them. But to me, it was easier, and I think my parents are not going to be very happy. (I3)

In our interview the following week, Hannah shared, "it wasn't as bad as I thought it was going to be. But, you know, they were still concerned." She said she had more complaints from the kids that week than from the parents about the change. The biggest complaints she received from the parents were regarding the fact they needed a printer to print the menu and sign for each day

now. Hannah said, “this is a point I raised with my principal because we have parents who don’t have printers.” (I5)

Hannah continued to send messages to parents every morning to keep the lines of communication open and allow them to know she’s still there if they need her. She continued to send *Google Meet* codes on their meeting days but worked hard to keep the amount of communication as low as possible, not wanting to bombard them. Communication from parents was quiet for the last few weeks of the experience.

Student Engagement and Participation during Remote Learning

Hannah was intentional about opportunities to interact with her students each week. The first week, she recorded herself reading a book about St. Patrick’s Day and shared a quick message with her students in a video she shared through *Remind* and email. As she considered planning for the next week, she said, “I want to try to find something each day to keep the communication and relationships going.” (I1) She established a weekly routine and hosted videoconference meetings through *Google Meet*. She wanted to engage the students in social and emotional activities that were connected to academic concepts to keep students engaged in some type of learning experience. “The kids are not excited about the new AMI plan. They liked the digital way with *Nearpod* as it was more engaging and fun to the students. I reminded them of other online options, including our *Google Meets*.” (I5)

She found activities that they could do together in their *Google Meet* sessions and created a weekly routine for these meetings. On Tuesdays, she invited on of the specials area teachers to do an activity with them. On Wednesdays, she did science experiments and shared how they could do them at home. On Thursdays, they did mathematics scavenger hunts and counting

activities. Fridays were reading days and she typically read a book out loud during the meeting and allowed them to share about the book. While these *Google Meet* sessions were not mandatory, she had good participation each week and always enjoyed seeing the kids.

During the first few weeks, she was able to see how many students were accessing the *Nearpod* lessons and had almost 100% of the online students accessing lessons each week. She had no way of knowing what type of participation was occurring with the students completing the paper packets at home those first few weeks. After Week Four, the only way she knew if students were completing the work on the menus was if a student mentioned it in one of their *Google Meets*. There was no expectation from the district about work completion during remote learning.

Administrative Expectations and Support Provided during Remote Learning

Hannah's superintendent provided updates and messages of encouragement to the teachers throughout the experience. The principals and other administrators were updated throughout the experience in weekly meetings and those updates would be shared within their school meetings or communications. There were no district guidelines or district-wide expectations for delivery methods, attendance, participation, or engagement presented during the experience. Expectations shared in Week Three included that no new instruction or learning targets would be presented and that fourth quarter grades should mirror grades given in the third quarter. Hannah shared the following thoughts about these decisions:

We are not to teach anything new in the fourth quarter. We can do things that we've previously taught, but nothing new. So basically, the fourth quarter expectations and standards are not being taught. I don't agree with it. There is so much that you can still teach and that you could still work with them.

And basically, grades are frozen, unless they are showing that they're going above and beyond, which is kind of hard to do because you're not teaching them anything new. I'm okay with this decision, only because with kindergarten, a lot of it is personal observation and individual assessment. (I3)

In a district-wide principal meeting during Week Two, various principals shared what they were doing with remote learning. It was at this meeting that her principal heard about the menu of activities. The principal presented it to their staff and led Hannah to believe it was a district-required method. She later found out this was not the case; that her principal needed a consistent method for their campus, as many of their teachers were struggling with online delivery. She explained further saying, “the only thing I can think of is that teachers have not implemented technology in their classrooms. And if they had been implementing it, I think they would have seen more success.” (I3) She learned that many teachers were getting complaints from parents about the experience, yet she had not received any complaints.

I haven't had complaints from parents about this, about it being too much or too hard. And, again, my kids are already used to doing digital platforms. So, the only thing that was new for them was doing the science experiments. That was the only thing new, so you know, my kids are rock stars. When it comes to it, they're little troopers. They know what they're doing and they're going to show everybody how to get out of the way. (I4)

Hannah's principal was supportive of her efforts throughout the experience and worked to maintain a positive and uplifting culture throughout the remote learning period. While she felt a bit misled with the transition to the menu method, she still appreciated his leadership and encouragement throughout the experience.

Hannah's team communicated throughout the experience in texts and some online collaboration. She explained they were a great emotional support system, “we're trying to work together to support each other and to keep each other, you know, sane.” (I2) The first week, the team divided the planning between the three teachers, one planning literacy, one planning

mathematics, and Hannah planning science and social studies. After the first couple of weeks, Hannah found herself doing the bulk of the planning and preparation of the work they would share with students each week and was the one to create the first menu template for their grade level. Hannah explained, “If I did not do, it would not get done.” (I3)

Hannah expressed concerns about the lack of support from the district level stating, “I haven’t heard much from the district level beyond reminders about not going into our buildings.” (I2) She also expressed frustration with the lack of support from the curriculum and instruction department, stating,

They wanted us to do online. We were doing online. I mean, it wasn't teaching online. It was giving them a digital platform that they could use to do some online things. Now they want us to change what we're doing and do these menus. The district is not providing these menus, we're having to make them. Each school is making them. I probably would have been okay with it if they had told us that from the beginning, instead of a month into us doing this, pull the rug out and not really give a support system with it. (I3)

Hannah expressed appreciation for the district’s technology curriculum specialists that offered trainings online, stating, “this was the best support district-wide. It’s a relief to know that they will help with technology.” (I2) Hannah was also appreciative of the support she received from the state level Computer Science specialists. Hannah is CSTE certified and received daily emails that shared resources, ideas, and support during the remote learning period.

Issues and Personal Learning Experiences with Technology

Students who needed access to a device could come to their school and check out a Chromebook for the duration of remote learning. The district technology department offered support to parents as needed, and the district technology curriculum specialists were readily

available to teachers and provided several professional learning opportunities for teachers throughout the experience.

During the first four weeks of remote learning, Hannah worked hard to ensure students and parents understood how to use *Nearpod* and join their *Google Meet* sessions. She used *Screencastify* to record herself walking through the *Nearpod* experience so parents would understand how students would use the program. She also recorded several books she read aloud to the kids over the course of the experience. She did not have a lot of questions or issues with the technology and explained:

I have really pushed digital things with my kids. I mean, I haven't been great at it, but at least they know how to log into a Chromebook. They know how to get into their *Clever* accounts [a single sign-on account portal]. And once they get into *Clever*, they know how to get into *iReady* [a digital mathematics program], and they know how to get into *Nearpod*. They know how to get into the various things that they need. So, it's only because they've been doing it in the classroom that they're not stressed and not panicked. (12)

While Hannah had been using digital platforms with her students, she quickly realized that was not the case with other kindergarten teachers and with teachers across her building. She expressed her thoughts about moving forward with a new perspective:

I think it has been a big eye opener for a lot of teachers, especially the younger grades that haven't been using things. Because that's what I hear a lot. And I had to make accommodations for the other kids in kindergarten, knowing that there were things I could have created on flip grid. And I could have been doing other things that that the other kids don't know how to do, or they don't have accounts for it. So, I think it's going to hit us, and I think it's time that we wake up and realize that technology is here. (11)

It may be one of those eye openers for some of those people who are kind of the ones who don't climb on board that maybe we need to be doing some of these things more. (15)

Other Factors Influencing the Remote Learning Experience

Finding a balance between work and home life was not a struggle for Hannah during the experience. She had set hours she worked and responded to emails and questions. Her parents knew that she was available from 7:30am until 3:00pm each day and that after 3:00pm, she may not respond until the next morning. She enjoyed the flexibility of the daily the schedule which allowed her to work on her graduate course work during the day, giving her more time at night with her family.

It's been a plus in the fact that I've actually been able to have a family life at night. Because back before this, I'd try to teach all day and then go home, and I'd do grad class. So, I'm finding that I actually have time to do stuff. I can sit with my family and watch a TV show. I can cook dinner, and it's been a blessing in that factor. (I3)

Hannah often expressed concerns about the learning experiences students were missing and how she did not feel she was doing her job during the experience.

We're not really holding them accountable. There's not an accountability piece. (I4)

I don't feel like I have actually taught them a lot, especially with this new menu and the things that we've been doing there. When we were doing the *Nearpod*, I felt like they were still getting some of the core instruction. Now, it's just kind of like busywork. They're not getting it. They're missing a bunch; they're missing a whole lot of the core stuff that they need. (I6)

I think everybody is going to be probably half a year behind and the kids that were already behind are going to be even further behind. (I6)

I think if we had been able to keep up with some of them on their path, we might not have been able to necessarily teach them something new, but we could keep them from falling backwards. (I6)

The decision her principal made to switch their remote learning delivery to a menu method deeply affected Hannah. She knew her students were doing well with their initial method and were excited about the work they were doing. During our interview in week three, Hannah

shared she had “hit the breaking point this week.” She had to pull herself back a bit, unplug from everything and vented to her husband, who later helped her regain perspective.

Yesterday, I hit my wall. I was like, you're asking me to redo everything! Unfortunately, with my team, if I don't do it, it's not going to get done. So, I sent them an email and sent them a text saying, ‘Hey, guys, I'm going offline. If I don't answer you, don't be offended. I have to decompress. I have got to get my brain back in the game.’ It just took me getting myself back. I reached that wall where I was like, ‘I'm done!’

Then, my husband came home, and he said, ‘what is wrong with you?’ And I spit it all out. He said, ‘Okay. You're being paid from eight to three. You're being paid to sit at home. You still have a job.’ And I'm like, ‘you’re right. Thank you.’ But yeah, he put me back in perspective and I needed him to put it back in perspective. He has taught me so many times how to step back. (I3)

Another struggle Hannah often discussed was her perceptions of inequity across the district and even among the teachers at her school. When the menu method was introduced, she talked about how different all the menus would be across the district. Even though they were using a menu, the activities would be different, and they still wouldn’t see the equity the district was trying to accomplish with the menus.

This is still a school level plan, not a district level plan. They are not making the menus for us, so it’s still not going to be equitable. It still allows for the schools to cater to their clientele, yet we need to have equity across the district. (I3)

I don’t dummy down my instruction in the classroom. I teach them like they are at [another elementary school] and the kids are doing it. They are learning it. Because I believe my kids can do it. Just because they’re in poverty doesn’t mean they can’t do it. My kids were doing the online learning and were really excited about it. It wasn’t unachievable and my parents weren’t complaining about it. (I3)

Hannah’s Reflections on the Remote Learning Experience

The remote learning experience provided opportunities for Hannah to try using *Nearpod* and other technology programs in new ways with her students. She appreciated the experience because it allowed her to apply concepts she’s studying in graduate school in relevant ways. She

learned she gets bored quickly and needs to be doing things throughout the day, showing her how much she missed the activity of teaching during the day.

One of the highlights of the experience was getting to see her students on their *Google Meets*. She loved the “chaos of kindergarten” on the calls.

Oh my gosh, getting to do the *Google Meets*, I mean, even though I did not get to see all of them, the ones that I did see, it was just it was precious. Even though it was kindergarten chaos, I think everybody should have to do a google meet or a zoom meeting with kindergarteners because they are absolutely hilarious. (I9)

She loved being able to do the science experiments with them on Wednesdays and loved their excitement as “this is something we wouldn’t have typically done in class.” She remarked, “it was just a nice experience to see them on a different level and them seeing me on a different level.” (I9)

Hannah felt that the biggest obstacles of the experience involved administrative decisions and lack of consistency with expectations. “The expectations just kept changing. You were constantly having to go back and redo things. I would get frustrated and upset. Their expectations of what they wanted weren't very clear and they changed a lot.” (I9) These changes also affected the way the students felt about the experience too. Hannah explained:

The students were so excited about doing the *Nearpod* lessons. They couldn’t wait for the next lesson and the next day. Their parents were like, *Oh my gosh, they get up first thing in the morning, run to their Chromebook, grab their headphones, log in and get on* and the parents are like, *I'm not even helping, they're doing it themselves*. And then when it switched to the menu type, they said the kids began fighting them about doing the work and not wanting to work. It wasn’t the same. They were used to me giving them *Nearpod* lessons with EPIC books online and you know, things like that. It was just more generic and so they became easily bored with it. And their parents were frustrated because they were bored. I mean they want to work. Five and six-year old’s, they want to learn, they want to work. (I9)

Hannah felt she was prepared to administer instruction through remote learning. She actively attends technology trainings and implements her training in the classroom. She took the platform they were already using and extended it to this situation. “Because I use a lot of technology with my kids in the classroom, it was as much of a difficulty for them to extend it into their home life.” (I9) Hannah often attributed the lack of technology integration by other teachers as one of the reasons the online learning was halted for her school during the experience. She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Require teachers to be trained in digital learning programs and require evidence of implementation in the classroom after the training.
- Teach students how to use their devices and the technology programs and provide expectations within these programs.
- Provide exposure time for student practice with the technology earlier and consistently throughout the year.
- Support parents with the use of technology and help dispel the fears surrounding using it.
- Host a parent night training that demonstrates using the technology, sets expectations, and provides guidance for the type of support students need when learning at home.

As she reflected on the spring remote learning experience, she realized how important it will be to start the year early using technology and introducing *Google Classroom*. The district announced they would use *Google Classroom* as the consistent platform beginning in Fall 2020.

I’m going to start the year pretty early using *Google Classroom* to get them used to it. This doesn’t mean I have to use it all the time. They just need to have exposure to it and know how to at least access it and use it. (I9)

She also recognized that she had done what she could to prepare her students for first grade, saying, “I can only hope they retain something of what they’ve been taught as they go to first grade.” (I9)

Transition Back to School in Fall 2020

Hannah's district returned to school, both on-site and virtually, on August 24, 2020, with Hannah teaching kindergarten for the virtual school option. Parents had the option to choose whether their student would return to school onsite or participate in virtual learning. They were asked to submit their choice and stay with this option for at least a quarter, even though some have been allowed to shift. Hannah started with 51 students in her virtual class, but the number decreased to 31 students after additional teachers were hired. Hannah shared there were 1900 students that initially elected to participate in the K-5 virtual learning option, however, a few have moved back to onsite learning after seeing the shift in rigor and expectations of the virtual learning this fall.

Hannah was excited about the experience she is having this fall, exclaiming, "I am teaching again! I'm teaching curriculum. It's so much better even though it's online." (I10) She explained that the virtual learning students were following the same curriculum and pacing of the onsite students. "We're trying to stay in line with the classroom so if they went back in the classroom this is what they would offering there." (I10) Students receive lessons delivered virtually with recordings, live meetings, and online curriculum tools. The district purchased the online component to their reading program which allows them to deliver a bit more of the reading curriculum virtually. Teachers have recorded their phonics instruction and students use the interactive videos to practice. They have a new mathematics curriculum they're implementing this year that has an online component that teachers are narrating and recording for the students. Science and social studies lessons are presented in alternating weeks.

Every morning they post their daily assignments for students in *Google Classroom*. Their assignments are in a *Google Slide* presentation with all their lessons for the day. Students have until Sunday evening each week to complete that week's assignments. She meets twice a week with students: once for phonics and once for mathematics. The students sign up for a time that is convenient for them on those days. Student participation in these meetings is "expected but not required." (I10) Hannah expanded on this response:

This is one of those situations where at first, we were told that they were required to do it. And then the district, administrators downtown, started noticing parents were jumping to homeschool and they said, 'Okay, stop saying that you're expected to do these things. We can't make them.' We've all been kind of frustrated with that because, I mean, we want the best for them. I can't go to their house. I can't pull them into the classroom. So please let me do the next best thing and meet your child. (I10)

She feels a similar frustration with the expectations of work completion and submission:

Why is it that we can't require them to do the work? What if they were in school? Well, we would be requiring it. The only way we can handle it is going to be through report cards. I have no evidence that you've completed the work. So, this is a one, you get a one because you did not turn in any of your assignments. When it comes to report cards, I can hold them accountable in a way. (I10)

Hannah has an increased confidence in her abilities this Fall and believes the experience in the spring has helped her be more prepared to tackle the new experiences with the virtual school option.

I feel comfortable using online platforms, and I wouldn't have if I hadn't used it last year. That has been probably the biggest thing, being able to get online with them and not be afraid. Because it is scary. I mean, even for me, it's scary to get on there and do it. It's helped me learn to be patient. And like if there are glitches or problems, just having the patience has really been a big factor. I don't think I would have been as patient with my kids now, if I hadn't known what to expect. (I10)

Hannah's Perceptions of Future Implications from this Experience

Hannah believes that virtual learning “has been a long time coming. Online learning has been around for a long time, but we haven’t considered it until now.” (I10) She believes the virtual option gives students who don’t do well in the traditional school setting a chance to thrive and succeed. She is hopeful that the district continues to provide this as an option. Her graduate work is in the field of Educational Technology and sees the relevance and timeliness of this experience. Through one of her graduate classes, she is working to develop a strategic plan that she can share with district administrators this year to persuade them to continue these efforts.

I'm working on a strategic plan to take at the end of the year to admin and say, *would you grant us another year? This year has worked would you give us one more?* I mean, there are parents that are saying, *this is the best thing for my child.* I'm hoping it's not a one and done. I'm hoping it continues. (I10)

3. Sherry's Story of Pandemic Induced Remote Learning

Background and Context

Sherry is a first-grade teacher in district located in a large city in Texas. Her elementary school serves kindergarten through fourth grade with an enrollment of 457 students and 25% free or reduced lunch eligibility. She had 18 students in Spring of 2020 and was in her 25th year of teaching. Sherry had no previous experience with delivering instruction remotely.

Her district was on Spring Break when the state began closing schools during the COVID-19 pandemic. They extended their spring break by one week and began remote learning procedures on March 23, 2020. Their remote learning was conducted online, with the first two weeks reviewing previously learned concepts and skills. Starting in week three, they offered new instruction in all subject areas. The district provided a curricular plan for teachers to use for the first two weeks, then asked teachers to begin planning their own instruction, using the same format beginning in week three. The district also maintained a district-wide schedule for the teachers that outlined specific times for their weekly live videoconferences, planning times, faculty meetings, and office hours.

Science Instruction in Remote Learning Compared to Science Classroom Instruction

Instructional activities for all subject areas were provided in the form of a 'choice board,' a grid that provides a variety of instructional links and activities students were to complete throughout the week. The students were expected to do each of the activities during the week, but they had a choice as to when they would do the activities within the grid. Science and Social Studies shared a grid featuring four science activities and four social studies activities as options.

For the first two weeks, students engaged in review activities about plants as living things. There were videos for students to watch, questions to discuss with their parents, and activities like drawing a plant and labeling the parts. Week Three brought new instructional material to all the subjects. Teachers were asked to either hold live learning sessions through videoconferencing or use recording tools to record the lessons and post for their students in English language arts and mathematics. New instruction in science and social studies came through the activities linked in the choice boards. Students were engaged in further learning about living things, food chains, and life cycles. Activities included a variety of videos, and topic-based readings through PebbleGo, a district-paid subscription service that offers online reading options and a safe online research site for elementary students. They did not do any hands-on learning activities.

When asked how the science instruction during remote learning compared to her on-site classroom instruction, she explained that their campus was transitioning to a STEM Academy in the upcoming school year and over 75% of their staff had been trained in Project Lead the Way (PLTW), a project/problem based instructional curriculum. Their science and PLTW activities were hands-on and engaging.

Science has to be engaging and full of experiments and figuring things out. Our students did a lot of hands-on and discovery learning in the classroom. But there was none of that during remote learning. (I8)

Science and social studies instruction alternated every other week in the classroom, and during remote learning, they were combined on one choice board. “The science and social studies choice board was actually the shortest board each week.” (I8) They did not do any hands-on activities because they weren’t sure the students would have the supplies needed and they did not want to overwhelm the parents. Their first week out of school was during St. Patrick’s Day and

they had been planning an activity for students to build their own leprechaun traps. They had been asking parents to save materials and a couple of her students used their supplies at home to make a leprechaun trap on their own.

I had a couple of students send me a picture. They had built a leprechaun trap themselves using stuff that their parents had been saving. We did not even ask them to do that. The activity was in part of a book that we read. So, they were just doing that on their own, which is great, because that's what you want them to do when you're doing that type of instruction. But, I mean, did not put it in there because we did not want to overwhelm the parents. (I8)

When they started school in Fall 2020, they started with a unit on germs. Their district has an HIV AIDS curriculum developed for each grade level. First grade covers germs, how they spread, and ways to stay safe during this district unit. Sherry felt it was a timely and relevant unit to use at the beginning of school. “It was a good way to start because they are already homed in on the germs.” (I10) Following their germ study was a unit on science safety and tools, where they would begin using STEMscopes, their district-purchased science curriculum. They had also engaged in a few STEM activities that were integrated with literacy. As the district’s first STEM Academy, they are also using Project Lead the Way curriculum for STEM integration. Even with this push for STEM integration, they have been instructed to focus on reading and mathematics. “So sadly, science and social studies gets the big push off. If we run out of time, that's what goes first. But, we have yet to have to push it aside. So that’s good.” (I10)

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

Sherry’s district opted for an online-only remote learning delivery method and allowed the schools and teachers to determine how they would deliver instruction to promote learning.

Since they had not been using a specific platform or learning management system, Sherry's team decided they did not want to overwhelm parents and students by introducing something new, so they sent all of their weekly lessons and activities through email to parents. Using the choice board system, they uploaded links to videos, activities, review games, and self-recorded lessons to the boards which were created in a *Google Sheet*. The link to the *Google Sheet* was shared with parents in their Sunday evening email, along with any specific notes or information about the upcoming week. The team was careful to use links to programs that had open access for parents and students, trying to keep login and password needs to a minimum.

Videoconferences for all students in the district were to be held once a week using the *Zoom* videoconference tool. The district provided a 'live' student engagement calendar for teachers in kindergarten through sixth grade. The schedule shared when each grade would hold their weekly *Zoom* calls. The district also gave guidelines regarding teacher office hours, faculty meeting days, and family flex time. Rather than hold live learning sessions through *Zoom*, her team opted to use their live *Zoom* time for social-emotional needs and record their new learning in videos that would be linked to their choice boards. Per district guidelines, there was to be no more than an hour of work in each subject each week.

We decided it would be better if we recorded our lessons and embed them into the choice board. We placed all the new learning videos at the top and highlighted them in bright yellow. Then the activities that go with the lesson are underneath. This way, everybody would still have access to the new learning lessons. (I2)

Her team split up the duties for recording the lessons each week. One teacher recorded the phonics lesson, one teacher recording the reading lesson, one teacher recording the writing lesson, and they took turns recording the mathematics lesson. Science and social studies did not have recorded lessons.

Communication with Parents: Issues and Opportunities

Parent communication was conducted primarily through email during the remote learning period. With the newness of everything, “there was an onslaught of emails the first week. Emails from the district, our principal, teachers, and parents.” (I1) The district requested the teachers limit their correspondence with parents to once a day to lessen the load on parents. The weekly choice board links are shared in their Sunday email with parents, so Monday’s were often frustrating due to technology issues they had to resolve. Her team was constantly aware of the load that parents were carrying during the experience.

We're trying to make it as easy on the parents as we can. We're trying to look at the big picture. We have parents that have lost their jobs. We have parents with multiple children in school. You know, it's like they're teaching in a one room schoolhouse. We've got parents with little kids, and they're working from home. So, we're trying to make the most engaging games or whatever it is, so that the kids can be able to do it on their own, with as little parent help as possible. So that's been a challenge. We put it all on the choice board...every subject was on a choice board and everything had links, so all they had to do was click on it. And we tried to make things not have an account where they wouldn't have to write down their username and password. That's a nightmare. (I1)

Parents were generally complimentary and offered good feedback throughout the remote learning experience. With exception of the technology issues, her communication from parents was relatively low each week. Sherry worked with one parent who reached out to her for help because she had debilitating anxiety and had lost her job. So, Sherry stepped in to help her. “You know, most families don't just come out and say, *I have lost my job*, so I'm sure that they're dealing with things that even I don't know.” (I2) Sherry worked hard to demonstrate patience and compassion to her students and their parents.

If you look at the big picture, parents are overwhelmed. They're trying to do their job from home, plus, feed their kids and school their kids. They're probably just doing something to get by, to be honest. I mean, nobody signed up for this. (I2)

One child's mom is working two jobs and she's doing the best she can just to survive right now. (I5)

A couple of parents reached out for help with their child who was struggling with the schoolwork or emotionally with the whole situation. She had one-on-one zoom calls with these students over the course of several weeks to help support and encourage them. "Kids are resilient, but they are showing the stress of this in a lot of different ways. Parents don't know what to do." (I5)

Student Engagement and Participation during Remote Learning

Sherry used her weekly live videoconference time to connect and engage with her students. On Wednesday, she hosted a morning and an afternoon *Zoom* call for her class. These calls typically lasted for 30 minutes and were focused on student's social-emotional needs and well-being. They had time to chat with each other; they played games; and she did a read aloud each week.

I give them like 10 minutes to talk at the beginning because they just want to see their friends, and they're yelling over each other. It's hilarious. I wish I could record them, but we can't. It's really funny just to see them interact over a computer. (I2)

Sherry found it was difficult to get them to participate and understand norms for being on live videoconferences, so she opted not to use them as an academic or new instruction venue. "It's hard for them to participate. Just because they're looking everywhere. I've got kids jumping on the bed, and they're all doing 50 million things. For the littles, it's not a good instructional tool."

(I3) She had consistent participation in her zoom calls each week, with an average attendance of 14 out of her 18 students.

Student participation in the weekly assignments grew steadily as the weeks progressed and the routines became more comfortable. It was difficult for their team to track work progress

the first two weeks, so they designed a system using *Google Forms* that students submitted for their weekly assignments. The teachers used the form submissions and any other evidence from parent emails or student messages to record student participation.

Administrative Expectations and Support Provided during Remote Learning

Sherry was grateful for the support provided by her district and campus administration during this experience. The district's curriculum and instruction team designed their initial instructional plans for the first two weeks. The lessons offered review games and activities in each subject. Sherry's team used these as their "spark for ideas" and revised some of the activities to make them a bit easier for parents. (I1) The district also worked on a plan to provide instruction in their priority standards for the remainder of the year and rolled that out to teachers during Week Two. At that time, teachers were given the format for learning and asked to design their own instructional lessons and activities for the remainder of the year. Sherry said this was helpful because "they did not have to wait for the curriculum to drop each week." (I3)

In Week Two, teachers learned of new guidelines the district was imposing to offer consistency and clarity across the district. The district had specified when each grade level could host their live video conferences as well as specifying Thursday for faculty meetings. Grade levels were given specific days for open office hours and family meeting times, granting two-hour blocks of time on two separate days to be available for parent/student concerns, issues, or one-on-one tutoring time, if needed. PreK through sixth grade were to receive five weekly lessons: reading, phonics, writing, mathematics, and science/social studies. These weekly lessons were not supposed to require more than an hour of work-at-home time. The district requested

that teachers provide instruction in new standards through live videoconferences or with prerecorded lessons that were shared with students.

Week Two for us was very stressful because our district started rolling out mandates for us and making schedules for all the teachers that they had to follow. Now that we're planning Week Three, the curriculum department is like, 'here you go. Now it's your turn.' And we're like 'what?' So, we're all in the midst of panic and doom right now. The expectations have changed. (I2)

The superintendent was aware of how stressful the changes were for the teachers, parents, and students and told them "it's like we're flying an airplane as we're building in the air. That's just how it's going to roll for now." (I2)

Initially, the district told teachers that they would not be grading any of the work being submitted. "It was made very clear to us that we cannot require any work to be done. Nor could we take grades on any of it." (I1) The district changed this expectation and asked teachers to use a pass/fail system for weekly assignments. While they typically used a four-point, standards-based scale for their report cards, the district changed all fourth quarter reporting to a pass/fail score. However, the teachers were not allowed to "penalize students for parent or equity issues" so they weren't allowed to give a failing score in their grade level. (I8) "Even if they did not participate, we weren't allowed to fail them. They said we couldn't punish a kid if their parents chose not to get on[line]. Everybody got a pass, everybody passed." (I8)

Sherry referred to her principal as "phenomenal" throughout this experience, trusting them on what was working for their teams and allowing them to do what they needed to do for their kids. (I2) They had weekly virtual faculty meetings on Thursdays, which was difficult for Sherry's team.

That's hard for our team because we usually plan on Tuesdays and have everything ready. And that has been the hardest thing because we don't like to work on the weekends. We're all seasoned teachers and we like to have everything prepared in advance. (I1)

The principal disseminated information to their staff throughout the week by sharing information with the team leaders, who would then share with their teams. This cut down on the number of emails they received each week. Her team worked collaboratively and divvied up the responsibilities throughout the experience. She was very glad to have a team that worked so well together, stating, "I can't imagine doing this experience with a dysfunctional team." Her teammates also provided mental and emotional support to each other. "We've all had days that we've melted down and thank god we're not all melting down on the same day. This is the only adult interaction we get. We need each other." (I1; I2)

Issues and Personal Learning Experiences with Technology

With the district's decision to require online remote learning, the technology department quickly arranged a check-out system for student Chromebooks. Any student needing a device could check one out from their school during certain hours the first week. Only two of Sherry's students did not have access to the internet at home. These were the students Sherry had difficulty reaching during the remote learning, too.

Sherry appreciated the remote learning experience and the time it gave her to learn and use new applications and programs that they had heard about but never had time to explore.

We have access to technology during the school year, but we're so busy teaching the kids that we don't sit down and play with it. So, now, it's almost like we're being forced to learn and use it. We have to because that's the only way they're able to get their instruction. So, we've been forced to find and use apps and programs that we knew were there, but we just don't have the time to sit and figure out because it does take a while. (I2)

With the district asking teachers to post live or recorded instructional lessons, Sherry had to learn how to use the zoom recording feature to record her lessons.

That was weird, you know, teaching to a computer. And it's like, I mean, it's truly winging it because you've got nothing and you're making it up on the fly. (I2)

You just have to get used to seeing yourself on camera instead of seeing kids, and you try to be like you are in the classroom, but it's just, it's different. I mean, there's no feedback. So, you're trying to think about all the different questions that you would normally ask the kids in a lesson, pause or you know, whatever. (I3)

And videoing lessons without any feedback was also hard. Because you feel stupid. You know, the think time and the questions. It was weird. (I9)

During our Week Two interview, Sherry shared, “I've worked harder this last month than I have in a long time. I mean, I work hard anyway, but this is, it's a whole different ballgame.”

Other Factors Influencing the Remote Learning Experience

It was often difficult to find that balance between being at home and being at school or work. Sherry expressed feeling “on call 24 hours, seven days a week”. (I2)

That's been the hardest thing...shutting down. Because I'm doing schoolwork from the time I get up to the time I go to bed. With little breaks in between, but that has definitely been the hardest part. Because parents are emailing you, messaging you, and they know that you're at home not doing anything. So, they need help. So, what are we going to do? We're going to help them. (I1)

It's kind of like a fine line because you don't know where to stop your communication. It's almost like you're on call 24/7. Which is really hard because if the parents are working, and they're asking you questions in the evening, you want them to continue doing it. So, you answer their questions like a dummy. And then you know, you're up all hours of the night. I can't handle it. It's too much. (I2)

By Week Three, Sherry felt like she had “found her groove” and was taking a lot of breaks during the day which allowed her to do things she needed to do. She also appreciated the flexibility she had to work in the evenings, if needed, instead of during the day. With a

sophomore in high school, who often needed her assistance with his work in the afternoons, she said, “It was nice to have the flexibility to determine when I work each day.” (I3)

Sherry appreciated the guidelines and expectations set by her district, but they were often a source of stress and frustration for the teachers and parents, especially during the first few weeks of the experience. “We did not really know what was going to be expected of us. And it is continually changing on a daily basis as to what we're supposed to do.” (I1) Adding to that stress was the fact that when the district shared about the changes, they were shared with the parents at the same time.

They were throwing a lot at us because they had to get it to the parents, and we were finding out at the same time as the parents. Then they [district] were like, ‘contact your child's teacher if you have questions.’ So, we were getting questions, and we're like, ‘we have no clue about the grading policy or about that change.’ So, that about sent us all over the edge. Because we did not know what to say. We were just like, ‘we found out the same time you did, we'll get back to you as we know.’ (I2)

Sherry's Reflections on the Remote Learning Experience

While the experience had its stressful and frustrating moments, it also showed Sherry a new perspective on her student's lives, their parents, and the task involved in engaging students through a virtual setting. “It's almost like the role of a teacher has almost flipped, because the parents are doing the work. And so, we're just answering their questions and kind of guiding them along the way and being their cheerleaders.” (I5) Many of her parents found themselves working longer hours or two jobs to keep their family surviving during this time. “Those parents that are working and the single parents, especially, who are working, cannot physically sit down with their child and do the work together.” (I6)

One of the highlights of the experience was getting an inside look at how her students' families worked. She appreciated learning more about their home lives and the part it played in their success.

We've always known that their home life plays a big part in their success. But I think it was just up close and personal as to how much that really is true. Seeing how that plays a part and just seeing how resilient kids really are. Even though I did have a few that you know, really struggled missing their friends and stuff. Overall, they really did a good job. (I9)

Sherry shared that she wants to use this perspective to support her in understanding more about her students. "I want to make it a point to drop by their house and see where they live." (I9)

Sherry shared her biggest obstacle during the experience was learning and using all the technology resources. "The district put a plan together very quickly, and it was helpful, but knowing what technology and resources to use was difficult. Trying to find something that worked for everyone." (I9) She appreciated the numerous companies that offered free subscriptions to their sites during this experience. "Being able to explore these sites for free helped us make decisions about resources we wanted to continue to use." (I9) She also expressed she "did not like looking at myself all day on zoom." (I9)

Sherry did not feel prepared to administer instruction through remote learning methods.

I never, in all my years, would have thought that we would ever do something like this, but we were forced to do it. So, we did what we could, and we tried to make it as fun as we could. And I don't think you can ever be prepared for having to do a whole 180 shift on how you deliver instruction because it's completely different. (I9)

She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Offer teachers more technology training on different platforms and programs.

- Learn from other’s experiences – talk to others to find out what worked/did not work.
- Gather feedback from parents about the experience.
- Establish common practices for all grade levels.
- Roll out different ways of learning at the beginning of the year and get students on devices and programs earlier in the year.
- Provide more social-emotional learning for our students.
- Keep usernames, passwords, and all login information in a central location for parents to access.

Sherry isn’t sure when we will know if this experience was effective. She believes for a select group of students, who had stability and support, it was probably effective. “It’s effective for the kids with parents who are still getting paid or have jobs, or with parents who could help them.” (I6) “You’ve always got those families that will do anything they can make sure their child succeeds. This is ‘home’ schooling, but it’s not homeschooling. It’s crisis schooling.” (I2)

I can't even imagine having to go through this without the types of families that we had and that that our district was able to provide technology and hotspots for those that needed it. I mean, I just, I can't even fathom what that was like for them. So, I'm very grateful for the district that I work for. (I9)

As she reflected on the spring remote learning experience, she said, “I really don’t want to do this again. There was no way to hold them accountable. There will have to be some definite changes that way if it continues.” (I4; I9) She was glad the experience went as well as it did, especially since she has teacher friends across the state that did not have a good experience.

I think overall, for what we were given, and the short amount of time they were telling us to get it done, I feel like we did a really good job at trying to keep the kids engaged and trying to learn. (I9)

Transition Back to School in Fall 2020

Sherry’s district opened their doors both on-site and virtually in August 2020. School was initially slated to begin on August 19th, but the school board made the decision to push the student start date back one week, making the new start date August 26th. Their first three days

were half days, allowing them a chance to introduce the new routines and protocols that were in place due to COVID-19. Their afternoons on those days were spent in virtual meetings with their administrators. They are not allowed to hold in-person meetings yet. The district also extended their school instructional day by 20 minutes, adding the equivalent of 10 school days to their calendar.

Onsite classrooms had to be reconfigured to meet safety guidelines. Sherry's team decided to make the best of a rough situation and they decorated their student desks like jeeps. They used the jeep life theme throughout their grade level and classrooms. They must rework all the ways they were used to doing things because they cannot have carpet time, partner work, group work, or share supplies. She said this was "stretching her as an individual." (I10) She expressed concerns about keeping students engaged with the new arrangements and the more solo-style work environment:

It's like almost going backwards because everybody's desks are in rows, and they're even spread further out. And so, it's almost like going back to the 60s. It's all strange and we need to keep them engaged. It's like putting on a Broadway show.

The district recognized that the virtual learning in the fall needed to look different from what they did in the spring. The online learning is more rigorous. The virtual learning teacher is teaching everything 'in person' through live *Zoom* calls. They have four zoom meetings each day. The virtual learning students are required to participate in all the zoom calls each day and complete the work on their own and submit it via *Google Classroom*. "The remote teachers are definitely drowning right now. Because they're kind of the lone person on their grade level, even though we plan together. I mean, she's having to test everybody individually and virtually. I mean, it's a nightmare." (I10)

“Going back to the classroom has not been an easy experience but is doable.” (I10) Her first graders do not have to wear masks when they are in their classroom and working at their desks. If they get up, walk around the room, or go anywhere else in the building, they must put their masks on. The students spend most of their time in the classroom with her, with exception of their outside recess, where they can remove their masks if they are not socializing, and when they go to PE, music, and art. “My students are with me all the live-long day [laughs].” (I10) Even though the experience has been trying, she said, “I am not going to take anything for granted. I am so happy to go back. It's so hard, but we're still trying to be as joyful as we can.” (I10) The experience has been exhausting, as she shared, “you’re just mentally tired. It’s a whole other level of sheer exhaustion.” (I10)

They were instructed to ensure that students knew how to log in, use the Chromebooks, use the programs, and know where to find all the information they might need in case they have to flip and go remote during the school year. They have also made sure parents know how to access all their child’s information too. “We were told from day one, make sure your kids know how to log in, where to find the information, etc. So, if you have to turn on a dime and go remote for two weeks, you're ready to do that and they'll know what to do.” (I10) Getting her students using the technology this early in the year is a very new experience for her because she did not do it before. “I’m definitely using a lot more technology this year. We’re showing them how to get in the *Google Classroom* and what to do because we could go remote at the drop of a hat.” (I10)

Sherry's Perceptions of Future Implications from this Experience

Sherry is not sure that education will ever look the same again. "Will they ever get to play games or do group work in the same manner again? We're having to rethink everything we've done before." (I10) She knows they will do more technology-based teaching and learning but is concerned about what this will do to her snow days.

I don't think it's ever going to be the same. You know, I really don't. I think we'll definitely do a lot more like technology-based stuff. But I know you've seen that game. Like what happens if there's no more snow days? I mean, like, that's bad! [laughs] I don't want to teach on a snow day. I mean, that was like a joy, you know. (I10)

Sherry was hopeful that the experience would give parents a new perspective and provide a level of respect that teachers don't often receive. However, she's not sure that will be the case.

I don't know I don't know if teachers will ever get the respect that they fully deserve. I can't see really anything positive coming out of this experience. I just think it's going to make it a lot harder for us. I don't know in what ways. I mean, just having to rethink everything you've always done. I think as a veteran teacher, that's really hard. I have a hard time thinking outside the box anyway. So that's really stretched me. But we'll get through it because that's what teachers do. We make it work. (I10)

4. Abby's Story of Pandemic Induced Remote Learning

Background and Context

Abby teaches second grade in a district located in a small city in Arkansas. Her elementary school serves kindergarten through fourth grade with an enrollment of 513 students and 45% free or reduced lunch eligibility. This was Abby's first year of teaching, and she had 20 students in Spring of 2020. She had no previous experience delivering instruction remotely.

She was notified on Sunday, March 15th that the district would begin remote learning procedures on Tuesday, March 17, 2020. The district conducted their remote learning solely online, although she had one student who received paper packets due to special services outlined in the student's Individualized Education Plan (IEP). Teachers had been instructed the week prior to the start of remote learning to prepare their students for the possibility of remote learning. This preparation included ensuring all students had a Chromebook issued to them, as well as making sure students knew how to login to and use *Google Classroom* and any other digital platforms used in their classroom. Students took their Chromebooks home on the Friday prior to the remote learning.

We all took time out of our day one day and taught the kids how to login and get into our *Google Classroom*, and we showed them how to fill out the *Google Form*. So, that was helpful because we kind of expected this was coming. (I1)

The district provided the format and schedule that elementary teachers were to follow for their remote learning, and teachers were instructed to continue following the district's scope and sequence documents for instruction in each subject. The first week presented several issues, as students found themselves overwhelmed with assignments designed to mirror the classroom instructional guidelines. After reflecting on parent, teacher, and administrator feedback, the

district adjusted its remote learning schedule beginning in Week Two with Mondays and Wednesdays being focused on literacy; Tuesdays and Thursdays being focused on mathematics; and Fridays were “catch-up days” for missing assignments, as well as the day that Science and Social Studies lessons were offered.

Science Instruction in Remote Learning Compared to Science Classroom Instruction

Science lessons were included in student assignments on Fridays and were not required to be completed. The science lessons were created by district literacy and mathematics facilitators using the district’s scope and sequence and a variety of online resources that connected to the lesson’s topic. Every second-grade teacher in the district used these lessons. Lessons were designed as interactive slideshows that students could work through independently. The slideshows included videos, pictures, read aloud options, interactive drag and drop response questions, interactive videos through *Edpuzzle*. They did not use hands-on activities during these lessons.

Science and social studies lessons were uploaded for students on an alternating, two-week rotation, equal to four science lessons and four social studies lessons during the remote learning period. In two of the lessons, students learned about what plants needed to survive and were encouraged to grow their own plants at home. In the other two lessons, students were introduced to a variety of habitats and the diversity of life within each habitat. As these lessons were presented on Fridays, which were considered a “catch-up” day for missing assignments, many of the students did not do these lessons.

I would say probably half of my kids did science and social studies lessons. The other half probably never logged in on Fridays because they knew they'd completed everything in the middle of the week on Fridays. I think a lot of the families saw Friday as kind of a day off. (I8)

When asked how the science instruction during remote learning compared to her on-site classroom instruction, she explained they did not have a specific science instructional time in their daily schedule: “we did not have a set science time every day, or every week, but we kind of just worked it in whenever we had the time.” (I8)

So, we would kind of just work through Mystery Science lessons whenever we had time. Or like on Fridays, we would work through one of the lessons and do the experiment. But it wasn't like we ever really had a schedule for it. It was just kind of like, *Oh, we haven't done science, like in like a week or two. Let's do some this week.* (I8)

When science was included in their schedule, it was done during their literacy block time, and they used lessons from *Mystery Science*, an online site with ready to use science lessons and videos. They would do their read aloud with a book or article on the science topic of focus, some of the *Mystery Doug* videos from *Mystery Science*, and then follow through with any experiments or explorations from *Mystery Science* lessons during their writing time.

So, a lot of times, if we were doing a science experiment or something, our reading comprehension time would be reading something about the science and then doing the experiment during the writing time that was directly after it. (I1)

Second grade had just started a project-based learning unit about space right before the school closure. “It was sad. The kids were so excited about the unit, but we had to scratch that plan.” (I1)

The transition back to school in fall 2020 brought new curriculum and safety restrictions that were part of the reason Abby had not started any science instruction at the time of our follow-up interview in the fall. The district had been revising their curriculum over the past few years, and the new curriculum for second grade was introduced this fall. Their science and social studies standards are included in their literacy curriculum. “They’ve woven the standards together in the Oral Language and Reading Comprehension time.” (I10) Each quarter contains

three units that are three weeks in length. The first science unit on Matter is the third unit, and she hasn't been able to really study that portion of the unit yet. "Honestly, I'm like working on a daily basis." (I10) She did explain that second grade was the last grade level in kindergarten through second grade to have their curriculum revised. Kindergarten and first grade have been using their curriculum for a year or two, and they are set up in the same manner. "In the spring, when they went virtual, they [K-1] would have been following that curriculum scope and sequence." (I10) When asked how she would address gaps in science learning this year, she said, "I'm not sure. It will be interesting to see what they know and don't know. I don't think there will be that many gaps since kindergarten and first grade already had this curriculum designed last year." (I10)

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

Abby's district chose to do remote learning solely online and had been preparing for this possibility prior to the official school closure. "We kind of knew that it was coming. Our school had prepared us, having us create *Google Classrooms* and teach the kids how to login through their Chromebooks and access everything on that." (I1) Abby had not used *Google Classroom* with her students prior to the shift to remote learning, so that was a new learning experience for her and her students. They used this platform throughout the remote learning period.

Communication with Parents: Issues and Opportunities

Abby used email as her primary method of communication with parents. She sent a weekly newsletter on Sunday evenings that gave an overview of the upcoming week and any

special announcements or notifications. This was a practice she had been doing since the beginning of the year, so she tried to stay consistent to what they already knew. After third quarter report cards went home in Week Three of remote learning, she added a mid-week email that updated them on their child's assignment progress for the week. "I feel bad sending emails that aren't completely necessary because I can't imagine how many emails parents are getting right now." (I3) Communication during the first few weeks of remote learning was a bit frustrating at times, especially when parents were reporting technology issues. "When something isn't working, we're all trying to figure out why it's not working. That stresses me out. Then I get a bunch of emails from parents, and I have to reply to every parent with the same thing." (I3) After Week Three, the communication leveled out and she did not receive a lot of emails from parents other than responses to her newsletter and mid-week progress reports. She did receive a couple of emails from parents in Weeks Five, Six, and Seven that were struggling to get their kids to do their work. She acknowledged their struggle and encouraged them to do the required one-assignment submission for attendance each day.

Student Engagement and Participation during Remote Learning

Abby wanted to stay connected to her students during this experience, so in Week Two she began hosting class hangouts through *Google Meet*, a video conferencing tool by *Google*. She had a scheduled meeting every Monday morning and every Friday afternoon. These meetings were designed as a social-emotional check-in and time for students to enjoy seeing other classmates. Mondays usually saw higher participation numbers, as students were excited to catch-up after a weekend. Besides letting students chat with each other, she would also engage them in fun activities like scavenger hunts and directed drawings. Her students were not overly talkative in the classroom and she sometimes noted how "awkward it is trying to get them to talk

or share socially” in the video hangout. (I4) She had an average of six students on each of the hangouts, seeing a small drop in participation during Weeks Five and Six.

Students were consistently submitting their assignments each day up until Week Five, where she said, “we saw decreased participation across the grade level this week. Students are over this.” (I5) She saw an increase in work submissions the following weeks but noted that “they are just getting the work done, it’s not the best quality.” (I8) She also expressed frustration with the students not watching their lesson videos and submitting their work rather quickly after it had been assigned. “I can tell from the timestamps [produced within the technology platform] that the students are not watching the videos and just submitting the assignments.” (I7)

It’s just hard because we’re spending our time making these lessons and they’re not really being used. So, it’s just kind of hard to balance the feeling of doing my job but also feeling like none of it really matters. (I7)

She also shared how difficult it was to score their assignments because some of their work obviously had a lot of parent support. “It’s very interesting because we can tell which parents are helping and which ones aren’t.” (I4)

Administrative Expectations and Support Provided during Remote Learning

Abby’s superintendent was supportive both prior to and throughout the remote learning experience. The district wanted to present a unified message and delivery, with consistency across the district during the remote learning period. The district established the elementary instructional schedules for the remote learning experience and student attendance was determined by the submission of at least one assignment each day. Instruction was to continue moving forward per the district scope and sequence in each subject. The superintendent got feedback from parents, as well as teachers, about the experience during the first week of remote

learning and adjusted their schedules beginning in Week Two. “There was a lot of feedback about it being too much work for kids and too much work for families. So, they modified it starting this week and the new schedule is really helping.” (I2)

Abby’s principal was supportive and good about communicating to them throughout the remote learning period. Her principal was responsive to their questions and allowed each team to decide how they wanted to work and do certain things during this time. The principal was also added to all their *Google Classrooms* to support their efforts and to “stay in the know.” (I2). She had a supportive team that worked well together and divided up the responsibilities of planning their lessons throughout this experience. There were five instructional components each week: mathematics number talk, mathematics problem solving, phonic, reading comprehension, and writing. Each of the five team members took a specific component and planned the lessons for it throughout the entire remote learning period. “We've been a good team the whole year. So, this switch has been pretty easy because we're all trusting of each other. And we know that everyone's giving their 100% into these lessons.” (I2) Instructional support was also provided to teachers by their literacy and mathematics facilitators from their building and across the district, working to design the science and social studies lessons for each grade level.

Issues and Personal Learning Experiences with Technology

The district ensured that students and teachers were prepared to move forward with online remote learning prior to the experience. Elementary classrooms all had Chromebook carts, with each student having an assigned device and some experience using them. However, the Chromebooks had not gone home with the students until this experience. The district also had several digital services and platforms in place before remote learning began. Teachers had access

to *Google Classroom* and other *Google Suite* products, as well as subject specific digital curriculum services the district had purchased. As the district saw teachers would be needing a screen recording service, they purchased licenses to Screencastify.

Abby had not used *Google Classroom* with her students until this remote learning experience. They spent time on the Friday before school closures reviewing the program with students and making sure everyone knew how to access their assignments in *Google Classroom*. While this was new technology to Abby, she did not stress over learning it or trying to use it. “I feel like technology things come easier to me than for some people, so it's not very frustrating to me to have to figure things out. I just click around and figure it out on my own.” (I1) However, technology issues did frustrate her at times, especially when there were the issues with websites and links they had used in their lessons. They found that their district had blocked several of the sites they were trying to use, especially *YouTube*, which is how many of them uploaded their *Screencastify* recordings of their instruction to *Google Classroom*. “Every week, we feel like we have it down...we know everything's going to work, and then there's something that doesn't work.” (I3) The district technology department was very “helpful and responsive in resolving these issues” as they encountered them. (I2)

It's hard because when something's not working, it's happening in real time as the kids are logging in. We can't really put a pause on it and have them log back in in 10 minutes. I think it's stressful because we all want to be able to fix it as fast as we can, but some things, we just can't figure out that quickly, so we have to go to plan B. (I3)

By Week Four, the technology issues had been resolved, they were in a routine, and “it felt like the smoothest week so far.”

Other Factors Influencing the Remote Learning Experience

As a first-year teacher, Abby found herself with some different struggles than the more experienced teachers. “I am still trying to figure out how to teach in person. So, having to teach them without a kid being there answering your questions or seeing how they are doing with it is very difficult.” (I1) Abby and one other teammate were both first-year teachers and found themselves struggling in the transition. “The two of us are just trying our best, doing what we can. We both feel like our lessons are awful, which I'm sure is not completely true, but it's just hard.” (I1) The district expected them to continue moving forward with their fourth quarter scope and sequence standards, which Abby found to be a difficult task. “I'm still learning the standards...I haven't taught them in person, and now I'm having to teach them online.” (I4)

Abby tried to keep a balance between work and home life during the remote learning experience. She tried to be consistent with what she would do during the school, keeping her work times from about 8:00am to around 4:00pm each day. While she had a few students doing their work in the evening, she tried to remain strict about responding to emails or student messages after 5:00pm each day. Her evenings and weekends were her time, only allowing herself to work on school needs on Sunday evenings. She is single and lives alone. “I have no one else to take care of except for myself, which I know is a unique situation. I know that I have a lot more time on my hands than most people in this situation.” (I3) While she maintained a balance of work and home life during the experience, she did not necessarily like having work within the home.

It's been really hard to have work and home be in the same box. I like my home life and my work life to be completely separate and not have any overlap. It's just been really weird and hard to have them be together. (I9)

She also believes she's meant to teach in the on-site classroom. "I learned that I'm not meant to be a digital teacher. I know there's people that love it, but I just am not like that. It's not for me."
(I9)

Abby's Reflections on the Remote Learning Experience

Abby recognized that she learned a lot through the experience. She has a better understanding of several technology platforms and resources that she had not used before and saw ways they could be incorporated into her classroom instruction.

"I consider myself to be tech savvy, but I still learned about a lot of resources and sites I did not know before. I saw ways that I could incorporate some of this into regular school, and how it could actually be beneficial, not time consuming or like a filler." (I9)

One of the highlights of the experience was getting to see the kids each week when they joined her in their class meetings. She loved the connections they made and wished she could have done it every day, though she wasn't quite sure how that would have gone with second graders. It was important for them to have social interaction during the experience. "I think everyone realizes this through this process, but it just shows how important in-person school really is for kids and having those interactions every day." (I9)

Abby felt that the biggest obstacles of the experience involved the student work. "Getting students to watch the videos and actually 'try' on the assignments was a huge obstacle because there was obviously nothing we could do at home to get them to do it." (I9) She explained, "if we had done this in class, they would not have gotten away with producing the work they gave me during this time." (I9) It was also difficult to know who was doing the work. "We never really knew if it was the kid doing the work or the parent doing the work. It's not like you can

really ask and say, *are you doing all this work for your child?*" (I9) This was a reason why she indicated she did not differentiate the lessons throughout the experience.

It's very hard because I wonder, even if I did differentiate something, those kids that typically struggle on a skill might have a parent sitting there that's doing it for them. And then I don't really know if that kid's doing it themselves. Which, on the one hand, it's great if they do have a parent sitting there doing this with them. But then on the other hand, it's like, how much of this is being done by the child? (I2)

Abby felt mental prepared to transition into remote learning, as they had been discussing possibilities of this happening prior to the school closure. However, she did not feel she was prepared to do instruction online and did not have a clear instructional plan going into it. Part of this feeling was due to not having a clear curriculum to use with reading.

The whole year, we were just kind of filling in, grabbing things from everywhere. So, going into digital learning, it was kind of the same thing. But even harder because the things we were using, we couldn't use those digitally. So, we kind of were just like fending for ourselves in teaching all this stuff online. (I9)

She also thought that students and parents did not take the learning experience seriously, so this made her instruction even more difficult. She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Have a central location for teacher resources: a place for websites, links to manipulatives, videos, etc. all in one place for us to use.
- Teach students earlier in the year how to use the technology devices and programs.
- Create equitable accountability expectations for student work and attendance.
- Set universal communication requirements – all teachers should be expected to use the same method and the same amount of communication.

Abby felt that the legitimacy and seriousness of the remote learning was not emphasized during the spring and this led to inequitable practices:

I feel like communicating like the seriousness and legitimacy of digital school with parents would be helpful. When you're at school, if you have parents that aren't involved

in their kid's learning, you can still make sure that kid is getting their learning at school, whether the parent decides to be involved or not. But when they're home and the parent is not involved and the kid's doing nothing...you've received no work from them, there's not much that you or administration can do to prevent that. (I9)

It was obviously bizarre and everyone's just trying to provide for their families right now. But also, it's not fair. Some kids have done nothing this whole time and are being counted present for a fourth of their second-grade year. And then some of the other kids did their work every single day and were counted present. It's just hard to balance that out on the teacher side, because these kids did everything and these kids did nothing, yet they're both being promoted to the next grade. (I9)

My mind is very much justice and fairness oriented. It's a law that your kid has to go to school every day. And they haven't been for the past nine weeks, but there's no consequences because, you know, obviously, we're in a pandemic. (I9)

With the inequity involved in the spring remote learning experience, Abby did not believe the experience was very effective.

As she reflected on the spring remote learning experience, she realized how important it was to model expectations with students and help them develop the independent drive to do their best. "It made me even more aware of how important modeling things is for kids. If they don't already have that internal desire to do their best and perform the way that they know they should be performing, then they're not going to try."

Transition Back to School in Fall 2020

Abby's district returned to school, both on-site and virtually, on August 24, 2020. Parents had the option to choose whether their student would return to school on-site or participate in virtual learning. They were asked to submit their choice and stay with this option for at least a semester. On-site learning looked different due to safety restrictions related to COVID-19.

Abby's desks all had to be in rows, facing one direction, and spaced six feet apart. This has proven to be difficult, as her room is small, and getting 20 desks spaced appropriately leaves

little room for movement around the room. Students must wear masks when they are in the building or not able to socially distance. While Abby thought the masks would pose a problem in the classroom, she shared that the desks in the rows had been the biggest issue.

Just being in rows, it's so hard for the kids. They can't interact together. They can't do group projects and all those things. And it's difficult to figure out how to keep them engaged in all our lessons with them just sitting there in their space. They can't really share things and they just can't interact the same ways that they used to. It's especially hard for those students that sit in the back. They can't see my board, and I'm finding it hard to keep their attention. (I10)

The district continued to use *Google Classroom* as their home base for digital learning but added the use of *Seesaw* as their instructional delivery platform. The students are utilizing both programs in the classroom and are required to take the Chromebooks home each night and return them each day in case they must pivot instructionally. Abby shared this has added another layer of stress, as “having a charged Chromebook is a problem if the student forgot to charge it overnight. We don't have a lot of extra chargers. So, this is a problem.” (I10) The students started on technology much sooner this year. “We have to make sure they know how to use the programs. This is much earlier than last year. We did not even have them start typing stories or anything until almost Christmas time last year.” (I10)

Going back to the classroom has not been an easy experience. “I feel like somedays I don't even know how to be a teacher.” (I10) Having her first year interrupted with remote learning in the spring, Abby has struggled to find her groove this fall.

I feel like it's been so hard to even get back into figuring out how to teach in person. Trying to add in all the digital stuff, just feels very overwhelming and daunting because even teaching in person is so different than it was last year. (I10)

She has encountered several unexpected issues, such as decreased attention span, technology issues, and pressure students feel when working on the computers. (I10) When asked to elaborate on these issues, she shared:

Their attention span is terrible. Keeping them focused and with you is difficult.

We've had all kinds of technology issues with Google and programs crashing. I guess everyone's on the system and it's messing with it.

Students seem to feel more pressure to do things correctly when they work on the computer. Like when they are writing or typing on the computer, they want everything spelled correctly. It's taking them a lot longer to do their work.

While it hasn't been the easiest start to school, she said, "It's been great to be back with the kids, and they are so excited to be back too." (I10)

Abby's Perceptions of Future Implications from this Experience

Abby believes the remote learning experience will positively impact education with the incorporation of more digital learning. "Being tech savvy is so important in society." (I10) She thinks it will take time for the teachers to truly figure out what's worth incorporating in the classroom.

Right now, everyone is just a fish out water trying to figure out what is going on. I don't know if everything we are doing digitally is actually making a positive difference, but at this point, at least we're trying. (I10)

She is also very curious to see if the virtual learning option remains an option for families. She also wonders if families will change their perspective of on-site learning because of this experience.

5. Bailee's Story of Pandemic Induced Remote Learning

Background and Context

Bailee taught third grade in a district located in a small city in Arkansas. Her elementary school serves kindergarten through fifth grade with an enrollment of 485 students and 63% free or reduced lunch eligibility. Bailee had been teaching for 11 years, and she had 20 students in Spring of 2020. She had no prior experience with delivering instruction for remote learning.

Her district began preparations for the possibility of remote learning the week of March 9th by asking teachers to have 10 days of Alternate Methods of Instruction (AMI) work ready to send home later that week. Bailee's campus sent their AMI work packets home with students on Thursday, March 12th. Remote learning procedures began on Monday, March 16, 2020. The district allowed the teachers and schools to choose their delivery methods, with some schools opting for all digital, some opting for all paper packets, and some doing a combination of both. Bailee's campus had surveyed their parents prior to starting remote learning to determine how many had access to internet and devices at home. The school determined they should begin with paper packets and transition into using online methods if the remote learning continued. Their initial packets contained two weeks' worth of review work for students. Her team pulled reading passages, writing prompts, review games, and fun activities that would help them with fluency. There was a feeling of panic and a frenzied rush to get the packets prepared.

It was just the panic of *I've got to get something to them*. And then we just got to sit back and wait and hope that we did okay, that we gave them the right stuff. So, it was just kind of a panic at that moment. (I1)

In Week Three, Bailee's team transitioned to online methods for instructional delivery, using *Google Classroom* as their platform for student assignments. She had 15 students using the online method and mailed packets to the remaining five students. Due to limitations with their

paper packets, the work in the paper packets did not always align to the work being assigned online.

Science Instruction in Remote Learning Compared to Science Classroom Instruction

Science instruction during remote learning was focused on reviewing concepts they had previously learned. The first two weeks consisted of reading passages, printed from their online curricular resource, *Discovery Education*. Students read passages about weather and climate and answered a few questions about each passage. As they transitioned into online methods, they were able to link students directly to their *Discovery Education* accounts which offered a bit more variety for student engagement. Students were able to watch videos, read passages or have them read to them, engage in interactive activities, and sample hands-on activities were available for students if they had the materials at home. Review concepts included weather conditions, climates of different regions of the world, natural weather hazards, and environmental changes caused by natural hazards.

They linked one science lesson each week, but students were not required to complete the science lessons because literacy and mathematics were to be their instructional focus during remote learning. Bailee's team therefore encouraged students to do these lessons each week with a special "Fun Friday" motivation. If a student had completed all their assignments for the week, then Friday's were their fun and games day, giving them a chance to play concept games, embark in personal research projects, and join in grade-level *Kahoot* games (interactive online games designed by the third-grade teachers).

When asked how the science instruction during remote learning compared to her on-site classroom instruction, she explained, “so much of the science instructed instruction in the classroom was so hands on, so inquiry-based.” (I8)

We had just started a project about sustainability, investigating what we could do because our building was going through construction. There was not only our trash, but construction trash all over our building and our school grounds. We were thinking about what we could do and generating ideas about that. Lots of discussion...lots of inquiry...lots of looking things up. And then, it just came to a grinding halt because of the remote learning. (I8)

Their classroom schedule allowed them 30 minutes of science instruction at least two to three times a week. She was not happy with the lack of emphasis on science during remote learning.

For the students, it was just, ‘do these lessons on *Discovery Education*.’ And that's all that our Science AMI education boiled down to was being wholly dependent on that *Discovery Education* techbook. One lesson a week on *Discovery Ed*. It gave them some sample [hands-on] activities they could do, but they may or may not have all the materials and that would be difficult to put together. Now, if we were in the classroom, we would be doing those [hands-on activities] more than we would be watching videos and reading passages like they are now. (I8)

Science instruction in the fall 2020 had not returned to the level of instruction Bailee preferred. According to district curriculum specialists, the new reading curriculum has science and social studies embedded in it. “In our current schedule, I only have 15 minutes available for science and social studies each day.” (I10) Those 15 minutes occur as the class is returning from their Specials class and before their lunch time. Bailee said, “washing our hands before lunch has taken over that time.” (I10) Bailee used some creative scheduling and independent learning time to work in some lessons from *Discovery Education*. *Discovery Education* lessons are assigned to students and they work on them independently during their morning work and small group intervention times. “I assign the lessons and check in on their assignments, pulling kids back to

me during intervention time to teach or reteach as needed.” (I10) They have been working on lessons about landforms and how wind and water can change the shape of the land.

It is really just reading the passage or letting the program read it to them. Sometimes there's a matching sort or answer a question or a short answer question, or there could be a video to watch. There's not a whole lot of hands on. There may be some interactives, like a little game or something to play out. I really like those because that keeps them engaged, and I feel like they understand the material a little bit better, but it's not the best. It's just reading and answering a question. (I10)

When asked about how they will address gaps in students’ science learning, Bailee honestly replied,

I don't even know how I would assess what their gaps are in science learning. And I know right now the gaps in their reading are huge. And there are gaps in their independent problem-solving abilities. And I have to keep reminding myself...these guys missed out a whole quarter of first grade. So basically, they are middle of the year first graders, so catching up on some stuff has been tough. (I10)

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

Bailee’s district allowed teachers and principals choice in their remote learning delivery methods. Bailee’s school started with two weeks of paper packets and then her team decided to transition to online delivery through *Google Classroom*. Her team used the first two weeks to “play around with the technology and practice using it with the students” before going into the online learning in week three. (I1; I2) She explained, “our technology skills were just not up to par” so they had a teacher from the second-grade team, “who’s just a *Google whiz*” teach them a few things. (I1) Her team set up a grade-level *Google Classroom*, rather than having a *Google Classroom* for each class and teacher, so they could all work within one location together. “I guess it was more of a work smarter, not harder, like if you can share the load, why not.” (I1)

This decision proved very beneficial during the times that different teachers had to step away during the remote learning period.

Communication with Parents: Issues and Opportunities

Bailee used email and *Class Dojo*, a class community messaging application, to communicate with her parents during the remote learning period. She used *Class Dojo* as her primary method for messaging parents, and she emailed the few parents who weren't on their *Class Dojo* system. Through *Class Dojo*, she was able to see how many parents had viewed her messages each day, which was especially helpful during the first two weeks of the experience when she wasn't having a lot of contact with her students yet. Bailee sent a daily message to parents and contacted other parents, as necessary.

During the first two weeks, the parents had questions about what they were supposed to be doing, how to do it, and the expectations for remote learning. As they transitioned into Weeks Three and Four, the parents had questions about the technology and how to use the Chromebooks or *Google Classroom*.

I'm hearing from parents just a little bit more now that we've gone to the virtual learning instead of the paper packet. Before it was a choice, you could do the stuff online or you can do the paper packet. Now that they don't have that paper packet, they're starting to understand how to use the computer right there along with their kiddos. They have questions, which sometimes I can answer and sometimes I can't. (I3)

As parents and students learned their routines, the questions from parents slowed down. Bailee continued her daily messages and would reach out to parents when their child was not completing work. Bailee shared a story about a parent who had six kids at home during this experience:

She was so overwhelmed with six kids at home. She has very few resources and doesn't have a vehicle. She was looking at this like an early start to summer. My teammate explained there is still schoolwork to do. We got the idea that she doesn't want to be bothered too much. But we are going to call at least once a week and check-in with the kiddos. Make sure they are at least getting something to eat. (I3)

Bailee and her teammate took turns contacting her throughout the remainder of the experience.

Student Engagement and Participation during Remote Learning

Bailee and her team wanted a way to connect with their students, even during the two weeks of paper packets. In Week One, they decided to try hosting grade-level *Google Meets*, videoconference meetings using the *Google Meet* platform. They wanted a time to check-in with the students and let them know how much they missed them. The meetings were successful, so they decided to continue hosting grade-level meetings each day at 11:00am. With these being a grade-level wide meeting, the kids got to see their friends from other classes, and the teachers had some flexibility if they couldn't moderate on specific days.

The whole third grade meets at 11:00am every day. We have been doing wish-wells and celebrations and just having that time to chat. But we've also been doing like a little mini mathematics lesson and then answering questions about how to access things online. Since the kids are still able to take AR reading tests, we're also encouraging them to do that and having a little competition between the three classes. We found out yesterday that we're going over the expectations [from district]. So, we were pleased about that because we weren't sure. (I2)

The team had a learning curve with the *Google Meet* system and struggled with some students who were using the meet system inappropriately. They spent time researching the system features and worked diligently to create more private and secure settings with their meetings.

The kids were able to use our link into the *Google Meet* anytime they wanted to without us, and we are getting a couple of complaints from parents that there is a little bit of meanness going on. So, we've spent the last three days researching *Google Meet* and how we can put a little bit more control on it. (I4)

This issue sparked many conversations about digital etiquette and safety online. Bailee hopes in the future, they can have parent training to support them in understanding how to safely monitor their child's activity on the computer and internet.

She was not sure how many students completed the packets during the first couple of weeks or with those students who did not participate in online learning. They had a bin located outside their school building for parents to drop completed packets, but they were told to let them stay there for a while in case of contamination. Student participation was easier to track with the online learning method. The 15 students participating in the online learning consistently submitted at least one assignment each day until Week Seven. "I saw a drop in submissions this week [Week Seven] and had to call eight students to let them know they were missing a lot of work." (I7) She said she thought "the kids are done. They just don't want to do it anymore. And honestly, I'm kind of feeling it too. I don't want to do this [teach online] anymore." (I7)

Administrative Expectations and Support Provided during Remote Learning

Bailee's superintendent provided updates and messages of encouragement to the teachers throughout the experience. The principals and other administrators were updated throughout the experience in weekly meetings and those updates would be shared within their school meetings or communications. There were no district guidelines or district-wide expectations presented during the experience.

Bailee's principal provided daily email updates, answering questions, or sharing answers to questions they had asked. She was supportive and encouraging throughout the experience. Her principal, assistant principal, literacy facilitator, and mathematics facilitator did the "manual work of assembling the paper packets, distributing Chromebooks, etc." (I2) Bailee expressed her

gratitude to the literacy and mathematics facilitators who gathered resources together for them and made suggestions for the paper packets.

Bailee's team was a unified unit, working together throughout the entire experience. They divided up the workload, taking turns with planning different subjects and hosting the *Google Meets*. They had planning sessions through *Google Meet* and supported each other throughout the experience.

I'm so appreciative of when we do our Google meets. We split up the work. They are quite a bit more tech savvy than I am, so they helped me out quite a bit with that. I think we're a pretty good team, a mix of youth and tech savvy, and then a little bit more experience on my end with how to find the resources and what really needs to be done right now. (I2)

During Week Eight, Bailee needed to attend to some personal issues, so her team stepped in and took care of all her class needs. "I'm very confident in my other two teammates taking care of it. So, it's really not that big of a deal." (I8)

Issues and Personal Learning Experiences with Technology

Students who needed access to a device could check out a Chromebook for the duration of the remote learning. The district technology department offered support to parents as needed through a district phone hotline and dedicated email account, and the district technology curriculum specialists were readily available to teachers and provided several professional learning opportunities for teachers throughout the experience. In Week Four, the district rolled out *Go Guardian*, a program that teachers could use to access student Chromebooks remotely. This program allowed them to log in a student's profile on a district-issued Chromebook, regulate the use of the apps being used on the Chromebooks, as well as support students who were struggling with using any of their programs.

I can use my Chromebook to look and see what they're using their Chromebook for. So, like for kids who have picked up Chromebooks yet they're not completing any of the online work. I can see that they have been on YouTube for the past three hours. And it also gives you access to close out YouTube on their computer. I have control over their computer from my computer. But I was like, 'Yes, this is a game changer!'

On the flip side, you can also go into whatever they're looking at. Like if I have a kid that's struggling to turn things in on *Google Classroom*, I can take control of their computer and show them where to go and help them do that. So, I like that part too, because I do have a couple of kids who are doing their work, but they don't know how to submit it. I told them, 'we're going to go in and try to do that together.' (I4)

Week Four was a week of overwhelming technology issues and learning experiences: "this week has just been a total technology dump, trying to figure out our technology." The technology issues were resolved, and they did not find themselves dealing with too many more technology concerns after week four.

Her team started in Week One with a *Google Site*, hoping to mirror the paper packet but with an online perspective. They would copy the work for the packets but linked the specific reading passage or mathematics page online in the *Google Site*.

We set up a *Google Site*, like a website that they could go to, where all the third graders could go and look at what they needed to do each day and click in on the link. And some of it has worked, and some of it hasn't. I think that was another thing with our panic is that our technology skills were just not up to par. (I1)

When teachers reflected on the confusion from Week One, they decided to look at what other teams in the school were doing. "We wanted to see what was working for them and what wasn't working. We want to make sure we have our plan set tight before we push it out to the kids and the parents so there's not confusion." (I1) They decided they would use *Google Classroom* as their platform instead of *Google Sites*. This allowed them to push assignments to their students, receive information on when it was submitted, and offer immediate feedback, making it a better instructional delivery platform than a website. They chose to create one *Google Classroom* for

all of third grade and each of the teachers had complete access in the grade-level *Google Classroom*. Bailee had used *Google Classroom* before this experience, but only with select students. She explained, “I used *Google Classroom* often in my class with my higher students. I think I was afraid to use it with my lower students because they needed to focus on learning to read and write.” (I9) She expressed a desire to change this practice in the future because “they have to be able to use the program and use it independently too.” (I9)

Other Factors Influencing the Remote Learning Experience

Finding a balance between work and home life was often a struggle for Bailee. “Being a parent and a teacher during this, it’s hard to find boundaries. Well, there are no boundaries.” (I1) Bailee has three children: a 4-year-old, an 8-year-old, and a senior in high school. Her husband is a fireman and works odd shifts at the fire station, so she often found herself juggling the kids and her teaching duties without any assistance. She found herself doing most of her schoolwork in the evenings: “I probably only get about an hour and a half of work in during the day. Then when the two little ones go to bed at night is when I get like grading and planning done, and answer emails.” (I3) She realized she had to give herself some grace on her work hours, knowing she wouldn’t be able to work normal school hours and take care of the kids at the same time. “As soon as I accepted that, I got better and managed things better.” (I3) She mentioned that neither of her teammates have children, so they were able to step in during the day and Bailee took the evening shifts. (I4) The experience gave Bailee’s family a new perspective on what she does in her job.

This experience has been good for my kids to see that I something other than a mom and that I can’t give this [teaching job] up to support them. It’s been good for my husband – he had no clue what I did. (I6)

Bailee also struggled with feelings of inadequacy and found herself wondering if she was doing enough. Seeing posts shared on social media by other teachers would lead to a comparison of what she was doing.

I'd think, 'I'm just doing the bare minimum.' They were doing small group reading with a couple of different groups on *Zoom* a day and I'm like, 'there's no way I would be able to do that. I'm barely getting an hour a day of work.' And sometimes I feel like it's not enough. But then I get a phone call or a text from a parent saying, 'we're really overwhelmed with the work that you have given us.' So, then I'm like, 'Okay, then what we're doing is fine.' It's really hard to find that sweet spot: not too much work, but enough to say we're still in school. (I7)

Bailee's Reflections on the Remote Learning Experience

The remote learning experience provided new perspectives for her family and helped Bailee realize how much she appreciated her teammates and how they worked together so effortlessly. She knew she liked having schedules, but she has realized how much she values having a schedule and routine and discovering "I am not as flexible as I thought I was." (I9) She recognizes she doesn't know as much about technology as she needs to know, and she looks forward to learning more about integrating in her classroom. She also learned how much she values student-led learning, discussion, and hands-on learning experiences in the classroom. "There may be a way to do that virtually, but I haven't figured that out yet." (I9)

One of the highlights of the experience was getting to know more about the kids and their home environments. She remarked that students on their *Google Meets* would "share a lot more from home." She also saw who had the power to persevere and "show grit...those who have grit and those who don't really care." (I9) She shared this funny story from her *Google Meet*:

We had one little guy come onto the Google meet every day with his cup of coffee. And he's like, 'I'm going to have to have this coffee to get through this.' And I would hold up my mine and say, 'me too, buddy.' (I9)

Bailee felt that the biggest obstacles of the experience involved reaching all the parents and students. “It was difficult to get through to parents and kids that did not have the same kind of technology or internet access.” (I9) When asked about how she was addressing the different needs of her students, she replied:

The only needs that we have been considering are kind of ‘the haves’ and ‘the have nots’: who has access to technology and who doesn't? Who has access to the internet and who doesn't? Who might have access to a parent that can help and who doesn't? (I2)

She struggled with not knowing how her five students who were completing paper packets were doing throughout the experience, too, since they did not participate in anything online.

I think that a struggle for me is knowing that I'm doing everything I can for these 15 but these five over here, I just kind of threw some papers at them and said, *Good luck*. I did not like that. That wasn't enough for me. (I9)

Bailee did not feel prepared to administer instruction through remote learning. While they attend a lot of required professional development, she had not had training in use of technology for this purpose.

I don't think anybody was prepared for this. You know, we have a lot of required professional development. And it's all very valuable. But I think maybe learning how to use your computer should be required. And just knowing we have required PD on curriculum and resources that are paper and books and stuff like that, maybe we need to be required to know how to use all the Google stuff. Before this, I was very familiar with *Google Classroom* and that's about it. I did not know *Google Meet* or all that other. I mean, the kids were figuring it out faster than me. Oh, that's a little scary. (I9)

She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Offer professional development for teachers on Google platform products.
- Have a set of expectations up front...we need to know what we need to do before getting started.
- Have consistent expectations and guidelines across the district. For example: specific expectations with the curriculum and pacing; what they should do in

synchronous meetings and how often they should be held; consistent procedures across grade levels.

- Start students on the computers earlier so they are comfortable logging in, navigating, and on the same “playing field” as others.
- Teach work habits and independent work skills. Students don’t need someone looking over their shoulder telling them they are doing a good job every 30 seconds.
- Teach digital citizenship and online safety and etiquette to both students and parents.
- Host classes for parents to learn how to use the computers and programs like our students use.

As she reflected on the spring remote learning experience, she realized how important it will be to use technology more with all her students in her classroom. She wants to make sure students are fluent with technology and with their independent work habits. “I’ll probably try to do more self-paced, independent activities in the classroom, so they see they don’t need someone on their shoulder at all times.” (I9)

Transition Back to School in Fall 2020

Bailee’s district returned to school, both on-site and virtually, on August 24, 2020, with Bailee teaching second grade. Parents had the option of whether their student would return to school onsite or participate in virtual learning. They were asked to submit their choice and stay with this option for at least a quarter, even though some have been allowed to shift.

Bailee explained that their onsite learning is to look more like a blended instructional model, integrating instruction through technology with the typical classroom instruction. Students in her class have specific phonics, reading, and mathematics lessons that are posted in *Google Classroom*, and students complete these lessons a couple of times a week on their own. If they must pivot to a remote learning model, students will know the process.

Due to COVID safety restrictions, they have a lot of procedures and strict time schedules they must follow. Their daily schedule includes a 10-minute mask break outside, lots of class bathroom breaks, and “a lot of interruptions to their day.” (I10) The instructional focus is on literacy and mathematics, and Bailee shared she feels “the time for instruction or my actual teaching time is cut super short this year.” (I10) They have restrictions on how their desks need to be arranged and are limited with any partner or group work.

I have to hope and pray that things get better. I’m hoping for more hands-on learning opportunities. The kids have to stay away from each other, but we know they learn best with others. Right now, they are just their own little islands, sitting at their desks, plugged into their computers. (I10)

Bailee has an increased confidence in her abilities this Fall. She believes the technology experience in the spring has helped her be more prepared to tackle new experiences:

In March, I thought, ‘oh, gosh, I can't do this. I'm going to have to resign because I'm just not technology savvy enough.’ And I'm thinking, ‘an old dog - new tricks, and that's not going to happen.’ But I've been really proud of myself. I'm linking things on the *Google Classroom*, and I'm doing some Screencastify videos. I am moving pretty quick. I'm pretty proud of myself. (I10)

Having those frustrations in the spring, and the remote learning, all the technology part and trying to figure things out. Thinking about what I can do to make sure that doesn't happen if we should go remote this time helped me be more prepared. (I10)

Another struggle during the transition back to school has been using the new mathematics curriculum the district is implementing this year, as it scripts the instruction. She doesn’t feel like she’s teaching, she feels like she’s a tech-facilitator.

I was really upset about this curriculum. You know what, I don't like to be told what to do. And there's three curriculums now that are telling me exactly what to say, word for word. But I have so much other stuff on my plate that I’ve decided, ‘Okay, I'll take that for now.’ I don't feel like I'm really being a teacher right now. I'm just facilitating things like a tech facilitator. That's what I feel like right now, a computer facilitator. I don't think I'm teaching mathematics and reading right now. And at this time, I guess it's fine. That's

what I need to be right now. Hopefully one day again, I'll be able to teach mathematics and reading and science. (I10)

Bailee's Perceptions of Future Implications from this Experience

Bailee believes that we will see more blended models of instruction being utilized because of this remote learning experience. She expects to see students on the computer more often and may even see more independent learning activities. She said, “while we may have some stronger, more independent kids, we may also see more kids falling through the cracks.” (I10) She is concerned students will “fall through the cracks because there will be too much going on at one time and it will be hard to pinpoint a skill deficiency with all the variables at play.” (I10) She believes it will take a lot more effort to figure out what the root issue is with a child, and with multiple students in a class, this could be cumbersome and difficult.

6. Lauren's Story of Pandemic Induced Remote Learning

Background and Context

Lauren taught fourth grade in a district located in a small city in Arkansas. Her elementary school serves kindergarten through fourth grade with an enrollment of 900 students and 8% free or reduced lunch eligibility. She was in her sixth year of teaching and had 26 students in Spring of 2020. She had no prior experience delivering instruction for remote learning.

She was notified on Sunday, March 15, 2020 that the district would begin remote learning procedures on Tuesday, March 17th. The district conducted their remote learning solely online. Teachers had been instructed the week prior to remote learning to prepare their students for the possibility of remote learning. This preparation included ensuring all students had a Chromebook issued to them, as well as making sure students knew how to login to and use *Google Classroom* and any other digital platforms used in their classroom. Students took their Chromebooks home on the Friday prior to the remote learning. "It was stressful because we weren't really supposed to tell the kids what was happening, even though we knew it was just a matter of time before it does happen." (11)

The district provided the format and schedule that elementary teachers were to follow for their remote learning, and teachers were instructed to continue following the district's scope and sequence documents for instruction in each subject. The first week presented several issues, as students found themselves overwhelmed with assignments that were taking six to eight hours a day to complete. After reflecting on parent, teacher, and administrator feedback, the district adjusted its remote learning schedule beginning in Week Two with Mondays and Wednesdays being focused on literacy; Tuesdays and Thursdays being focused on mathematics; and Fridays

offering ‘extension’ lessons from science, social studies, guidance counseling, and library. Students were to choose two of these extension lessons and complete them each week. Students also had daily expectations to complete their independent reading and mathematics practice through digital curriculum services that the district had purchased and had been using prior to the remote learning. The district’s goal was to present a unified presence in student’s lives, especially when more than one student was working from home. This was an added benefit to parents because they only had to learn one schedule and one way of doing things. “The district did everything they could to make it as smooth as possible for teachers, parents, and students.”

(11)

Science Instruction in Remote Learning Compared to Science Classroom Instruction

Science instructional activities were considered extension activities in their weekly assignments. They were not required to be completed, and students got to choose which two extension activities they completed each week. The science lessons were created by district literacy and mathematics facilitators using the district’s scope and sequence and their digital curriculum resource, STEMscopes. Lessons were designed as interactive slideshows that students could work through independently. The slideshows included videos, exploration components from STEMscopes, pictures, and questions developed by district facilitators for student response to learning. They did not use any hands-on activities during these lessons.

Science lessons in the first half of remote learning focused on natural hazards and their impact. Lauren collaborated with her library media specialist and designed a research project using this topic to drive the students’ research questions. She incorporated the aspects of research and writing in her literacy instruction and encouraged students to focus on the science lessons during those weeks. During the last half of remote learning, science lessons focused on changes

in Earth's surface caused by weathering and erosion. "Participation in science lessons was relatively low each week. I think the kids gravitated towards the counselor [guidance lessons] and library lessons because they were easier and had less critical thinking." (I8)

I would love for it to be a situation where we could say it's required this week for you to do science as one of your extension activities and the next week it's required for you to do social studies. I think that would have been a better approach to take to ensure that students were engaging in it [science] more. (I8)

Friday extension lessons were optional, based on student choice each week, which meant scoring science for their fourth quarter report cards would be difficult. "We can't truly score because it's not consistent across the class or grade level with who did what and to what level they completed it." (I7) For this reason, teachers were instructed to score their science and social studies with the comment "taught but not assessed." (I7)

When asked how the science instruction during remote learning compared to her classroom science instruction that year, Lauren admitted their instructional time was consumed with a statewide reading initiative and "we would get to a point in the quarter where we'd be like, *okay, when are we going to do science? We've got to do science. But when do we have the time?*" (I8) Her kids loved science and she wanted to do it more often. When asked how often they had science instruction in their classroom, she replied, "no more than two weeks in a quarter. Just trying to implement everything that we were required to implement, specifically with literacy, consumed so much time each day, especially with the RISE initiative." (I8)

Lauren's district uses *STEMscopes* as their curricular resource. *STEMscopes* provides a series of lessons within a scope, or topic, delivered through the 5E Instructional Model. Students engage with ideas around the concept being introduced, then they explore the concept, typically with a hands-on activity. Students add to their exploration discoveries through reading passages

or other research methods to further explain the concept. In the elaboration section, students typically make connections to their learning in other subjects like reading and mathematics. This is also when STEM lessons or connections are introduced. For evaluation, the program has different types of assessments to use with students like multiple choice, open response, or CERs (Claim-Evidence-Reasoning writing). Within a science unit, they might spend a few days in science lessons or STEM lessons, but they wouldn't finish all the activities in the scope. Lauren explained that her team expressed the desire to change their science instruction and "integrate the science instruction with mathematics and literacy in a more natural way next year." (I8)

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

Lauren's district chose to do remote learning solely online and had been preparing for a couple of months prior to the school closure. Her superintendent had been communicating with parents since February, keeping them updated on what could be coming, and that it would be in their best interest to have internet services at home. Lauren and her team used *Google Classroom* as their learning management system and *Google Meet* for their video conferences. Lauren's students had already been using *Google Classroom* prior to the remote learning, but they spent time on the Friday prior to school closure walking through the online process.

I'd set them up to be super successful. I teach fourth grade, so they are used to *Google Classroom*. So, I felt confident that as far as the technology side of things, they were going to be fine. They can navigate things pretty well on their own, and that was kind of peace of mind. So as far as that went, I wasn't worried about them being able to receive the resources, do the assignments, or anything like that. (I1)

Lauren tried to make her *Google Classroom* resemble her school day as much as possible. She posted a schedule, created a daily slideshow with all their assignments linked for the day, and

recorded a video message that previewed the lessons. She used *Screencastify*, a web-based screen recording service purchased by the district, to record her video messages and other instructional lesson videos throughout the remote learning period.

Communication with Parents: Issues and Opportunities

Lauren maintained a consistent method and format of communicating with parents through the remote learning period. She used email as her primary method of communication, making phone calls to parents as necessary or when students were expressing frustration, confusion, or feeling overwhelmed. She tried to call all her parents during the first week of remote learning to touch base and find out if they needed any assistance. Each week she sent an email to parents on Sunday that included a preview of the upcoming week and video message that walked them through the expectations that week. In the first few weeks, she sent two to three emails each week, communicating schedule information, small group instruction meeting times, and information about their weekly video conferences. Around Week Four, she began sending out Thursday student progress emails. These emails were designed to tell the students what they needed to complete for credit that week and the parents were copied on these emails. As the parents grew more comfortable with the situation, she tried to keep emails to a minimum.

I'm trying to not overwhelm the parents. I've tried to make sure that I'm choosing when I reach out to them because I don't want it to become something where they feel overwhelmed or pressured. So, I'm trying to just be mindful of that. (I7)

Lauren met with eight parents in virtual parent/teacher conferences after third quarter report cards were sent home in Week Four. She said, "parents are eager to keep their students going, but they are struggling with their kids wanting to do their work right now." (I4) She was

able to contact all but one of her parents during the remote learning period. “I realize everyone is going through a lot right now, and I’m trying to support them from afar.” (15)

Student Engagement and Participation during Remote Learning

Lauren worked hard to keep structures and routines from the classroom in place during the remote learning experience so that students would have a sense of familiarity in their day. In their classroom, they would have a morning circle time that focused on social-emotional learning needs or issues that students may have been struggling with, like jealousy or bullying. She kept the premise of this morning circle time in remote learning using *Flipgrid*, a free, web-based video-discussion platform that they had previously used in their classroom. Each day she would post a question and the students would respond with a video message through *Flipgrid*. She moderated the responses and kept the discussion flowing each day. She also held weekly whole-class video conferences that were designed as a social-emotional check-in. In this meeting, they also held their “time of gratefulness”, which was another routine they had in their classroom prior to remote learning. During this time, students share things they are grateful for and it serves as a period of reflection.

Lauren incorporated her small group instruction time for reading and mathematics by hosting small group sessions through *Google Meet* each week. Students had assigned small group instruction meeting times each Friday, and throughout the week she offered small group work sessions that were open to anyone who needed help or had questions about the literacy or mathematics assignments that day. Student participation in the small group meetings was consistent throughout the remote learning period, only seeing a slight decrease in participation during Weeks Four and Five. She said, “the kids seem to be in a rut right now. It’s hard getting

them to participate.” (I4) However, participation picked back up after she sent a few emails to parents encouraging their child’s participation in these meetings.

Students were expected to submit a specific assignment each day, along with completing a *Google Form* survey at the end of each day that shared what they did, how long they spent on it, and what they enjoyed most that day. The submission of the assignment and the survey acted as their attendance confirmation each day. During the first three weeks, she had three students who had not submitted any work. These three students were her Special Education inclusion students, and she knew they would struggle with the assignments. She collaborated with her inclusion support teacher to find ways to engage these students on their level and began trying some new practices with these students in week four. She contacted their parents individually and explained the changes and the importance of them submitting work each day. After these changes, she saw an increase in their participation and work submissions. She only had one student who consistently missed submitting work or participating in any of the digital learning activities.

Administrative Expectations and Support Provided during Remote Learning

Lauren’s superintendent was proactive and supportive both prior to and throughout the remote learning experience. The district wanted to present a unified message and delivery, with consistency across the district during the remote learning period. The superintendent got feedback from parents, as well as teachers, about the experience during the first week of remote learning. “The superintendent and principals met and discussed the feedback and made immediate adjustments to help us significantly reduce the workload on our students.” (I1)

The district established the elementary instructional schedules for the remote learning experience and student attendance was determined by the submission of at least one assignment each day. Instruction was to continue moving forward per the district scope and sequence in each subject. They continued using their mastery-based grading scale and scored specific assignments each week using their performance levels scores (e.g., 3-meets mastery, 2-progressing but not yet consistent, and 1-not yet mastered). Their grade level team worked together to determine which assignments would be scored for reporting each week.

Lauren's principal was supportive and responsive to their concerns and needs throughout this experience. Her principal is a member of every *Google Classroom* and gets every notification of posts, messages, and assignments from every teacher in the building. "This keeps her aware and in the know in case she receives questions." (I2) Her principal also kept up to date with their level of parent contact and supported them in the case they couldn't contact any of their parents.

Lauren's teammates worked well together with instructional planning and supported each other when things got hard. They were in constant contact with each other through text messages and emails, and sometimes this posed a struggle for Lauren as "it was hard to answer at all times of the day." (I2) Her team divided the planning workload from the beginning of remote learning, with each person planning the lessons for a specific component each week. They rotated the planning of these subject components throughout the remote learning period so that each one would have the experience of working in all the subjects. They had weekly planning sessions through *Google Meet* every Tuesday and by Week Four had their instruction mapped out several weeks ahead.

We continued to map out the rest of the year as a team and decided who's going to be planning what. We have pretty much everything mapped out for the next three weeks. So, we're not rushing last minute during the week to get all our lessons done for that week. (I4)

Instructional support was also provided to teachers by their literacy and mathematics facilitators from their building and across the district, working to design the science and social studies lessons for each grade level. “This helped us take something off our already full plates.” (I2)

Issues and Personal Learning Experiences with Technology

The district was prepared to move forward with online remote learning prior to the experience, as all students in the district had access to a Chromebook or other device. Elementary classrooms all had Chromebook carts, with each student having an assigned device. The Chromebooks had not gone home with the students until this experience. The district also had several digital services and platforms in place before remote learning began. Teachers had been using *Google Classroom* and other *Google Suite* products, as well as subject specific digital curriculum services the district had purchased. As the district saw teachers would be needing a screen recording service, they purchased licenses to *Screencastify*. Lauren appreciated having the ability to screencast, “I literally walk through it with them like I would in the classroom; instead of having it behind me on the projector, it's in front of me and I'm clicking through the slides.” (I1)

Lauren honed her skills in *Google Classroom* and learned how to organize her posts by topic, making it more efficient for students to access their assignments. She also learned how to use *Edpuzzle*, a web-based system of creating interactive video lessons. “I have really loved using this program. It provides that chance to teach, but then pause and check in, and then

provide more teaching, pause and let them try it again.” (I5) Lauren saw many ways she would be able to use this in her classroom, too.

Other Factors Influencing the Remote Learning Experience

Finding balance between work, home, and family life was not difficult for Lauren during this experience. Lauren was intentional about her schedule during the week and made sure it offered her flexibility to have a dedicated lunch time, take breaks and get fresh air, or even enjoy her morning breakfast. She was intentional about “unplugging on the weekends” and spending time with her husband. She did admit that she wasn’t experiencing the same amount of stress as many of her teammates.

I think what makes it easier for me is that I don't have kids at home. It's a lot easier for me to be able to focus fully on work during the school day or even in the evening. I don't have anyone else that's needing me right now, other than my husband. So, I can see how teammates or other people who have children at home are having to divide their attention. They don't ever get a chance to do something, just for themselves or have a moment of relaxing and kind of unplugging. And then too, they kind of feel guilty if they are working on school and not investing as much in their kids. So, I can see where that level of stress and emotion is coming from. I'm not experiencing that personally. (I3)

Lauren expressed concerns about her students and how they were doing. Seven of her students received Special Education inclusion support services in the classroom from an inclusion support teacher. They co-taught lessons together when appropriate, and at other times the inclusion support teacher worked with the student individually or in small groups during independent work time. Lauren worked alongside the inclusion support teacher to provide instruction to these students in the classroom based on their Individualized Education Plans (IEPs) and she was concerned about how they would manage during the remote learning experience. “One of my inclusion students is averse to work on computers, while another one

can't read. I don't think it's fair to use the same approach that we're giving to the other fourth graders." (I1)

The biggest thing that I'm worried about are my inclusion kids declining in nature. I had a couple that had made such growth. And I'm just so afraid that this is going to stunt that. And I really have not found a solution yet, but I'm trying to figure out, I think it's going to end up being more work for me, which is fine. But I really want to do more individualized instruction for them. (I1)

Lauren collaborated with the inclusion support teacher throughout this experience. In Week Three, they adjusted their focus with the inclusion students to ensure they targeted their IEP goals specifically. They received grade level instruction on Mondays and Tuesdays and then received differentiated instruction and assignments on Wednesdays and Thursdays. The inclusion support teacher also hosted small group instruction sessions with these students as part of their plan for differentiation.

Lauren's Reflections on the Remote Learning Experience

Moving into a remote learning plan for instruction required a lot of extra grace on everyone's part. "I understand why we did things the way we did. We had to have a lot of grace and we set very basic expectations for things like attendance and grading." (I9) Since they did not know the situations at home, the district would not allow teachers to penalize the students for not completing their work. "The work wasn't the same with digital learning and we did not always know who was doing the work, the kid or the parent." (I9) If they were to go into a remote learning experience again, Lauren said, "it would have to look different. It can't be this open ended and flexible as far as expectations go." (I9)

One of the highlights of the experience was seeing how some students thrived in this model of learning. "It could be really great for some and would allow us to push some of our

students beyond the normal expectations.” (I9) She began to think of all the possibilities this model could provide for personalized learning and questioned, “how much more they could thrive if we allowed ourselves to think with that mindset of a very differentiated individualized approach with their digital learning?” (I9) She was also able to spend more one-on-one time and small group time with students that needed additional support and gave her focused time with them, whereas in the classroom, her attention was more divided.

Lauren shared her biggest obstacle during the experience was not being able to reach certain students at different times and not having parents who could always support the students. There wasn't much they could do if the students weren't participating or submitting their work. “If a student wasn't getting on or if a parent wasn't responsive, we kind of were at the end of our rope.” (I9) “Navigating special circumstances and trying to support students from afar is hard.” (I5)

Lauren felt prepared to administer instruction through remote learning methods. She thought the district did a good job of preparing them. She appreciated that the district had a plan and clear expectations for their schedules and assignments. “It ensured that we were unified as a school district and ensured that we were meeting high expectations for quality instruction.” (I9) She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Provide more experience and practice with programs like Screencastify to manipulate and more effectively use the programs.
- Empower teachers to use the *Google Classroom* platform. Teachers need to feel confident in using these tools and in teaching students how to use them.
- While their administration was great with setting expectations, teachers need clear expectations set for them from a higher power to be successful.

- Host a digital “walk in my shoes” night for students and parents. Walking them through what it looks like to interact with the digital platform and programs in class.
- Establish expectations with students on their use of the technology, email, and assignments through *Google Classroom*. Help students feel confident with all things they’d be asked to do digitally.
- Providing learning targets to parents ahead of time, as well as directions being written and discussed in a video message. This would help support parents each day with what their child should be doing.

Lauren had mixed feelings on whether the remote learning experience in Spring 2020 was effective for her students. “I think it varies significantly student by student.” (I8) When asked to expand on this thought, she divided her response into three groups of students: those at mastery in all areas at the end of third quarter, those who are in the ‘middle of the road’, and those students who are struggling.

Comments regarding students at mastery in all areas at the end of third quarter:

They, for the most part, are very responsible, independent students to start with. So, they've not missed a beat with digital learning because they can get on and do their lessons...they can do everything.

Comments regarding students in the ‘middle of the road’:

They're making progress, but they're not fully consistent in everything. I would say their effectiveness is dependent on parental involvement at home. Do they have someone that they can ask a question to, or that's looking at it with them and can give them feedback if they're on the right track or not? Because if they have that, then it is being effective because the parents are assisting, or at least giving them the feedback. Others at this level that don't have someone that can provide that support or who is checking in on them are not as reflective in their learning and may not recognize they need to ask for help. I don't know how much of that is their fault, and I'm not blaming the parents either. They just don't have the situation where they can have that feedback and that support. So, for them, it's not as effective as it would be in the classroom because I would be able to catch it right away and get them on track.

Comments regarding students who are struggling:

It's an interesting dichotomy. I have those who are working really, really hard, and I'm seeing good growth, and they're putting forth effort. They may not turn in every single assignment that all students in fourth grade are doing. The students and their parents are putting in a lot of time and effort to do it.

I have a few other students who I'm noticing that when they turn in work, there are no spelling errors, and all of a sudden, they're doing multi-digit multiplication and multi-digit division. And that's not something that they're capable of doing independently. And so, then it's that question of are they supporting to a degree that is inhibiting the student from being able to learn or do it again in the classroom without a parent next to them. It's just not a feasible amount of growth in that given time and circumstances.

I have a few students that are struggling and aren't receiving any support and are losing the momentum that we had gained and worked towards throughout the year.

As she reflected on the spring remote learning experience, she believed that having the inclusion class set her up well for this experience. She was already used to being very explicit with her instruction versus some of her colleagues who were more open-ended and did not use as much explicit instruction. She felt this benefitted her in the digital learning model. Her student feedback during instruction helped her be mindful of her pacing in her instructional videos and helped her be more aware of how she was approaching or explaining something. "More than anything, it helped me to be very aware of thinking through when I explain something or when I approach something. Am I doing it in a way where they can truly run with it because I'm not in the room to clarify or to give them additional feedback?" The remote learning experience reinforced the need for students to have connections and interactions during their day. "It wore on the students to not be around their classmates or have the stability of a routine." (I9)

Transition Back to School in Fall 2020

Lauren's district opened their doors, both on-site and virtually, on August 24, 2020. Lauren began a new role as an assistant principal in a different elementary school. Due to this new role and her changed responsibilities, Lauren was unable to participate in the follow up interview process in the fall.

7. Kelly's Story of Pandemic Induced Remote Learning

Background and Context

During the remote learning experience of Spring 2020, Kelly taught fourth grade in a small district located in a remote town in Texas. Her intermediate school serves fourth through sixth grade with an enrollment of 342 students and 64% free or reduced lunch eligibility. She was in her 23rd year of teaching and had no prior experience delivering instruction through remote learning methods. Her team divided up the subject area instruction for their 60 students; she planned the English-language arts (ELA) components, another teacher planned the mathematics, while a third teacher planned the science and social studies.

Her district was on Spring Break when the state began closing schools during the COVID-19 pandemic. They extended their spring break by one week and began remote learning procedures on March 22, 2020. In a virtual faculty meeting during the spring break extension, they were told to do everything online through *Google Classroom*. The grade level teams met that day and created templates for their courses, however, the following day, they were instructed to change them so that all would be using the same school-wide template. Due to inequitable internet access throughout their community, they also created paper packets that parents were able to pick-up for their students. If online instruction was chosen, students were able to check out laptops from the school for the experience. Kelly's team had 20 students start instruction online, with 40 students receiving packets. This number fluctuated during the experience due to limited internet access, and eventually they had 10 students completing the work online and 50 using the paper packets.

Science Instruction in Remote Learning Compared to Science Classroom Instruction

Science instruction during remote learning was planned by one of Kelly's teammates. With paper packets being the prominent delivery method, science instructional activities were limited to worksheets on previously taught concepts. The teacher created a few quizzes online through *Google Forms* to assess students, but they did not do any hands-on activities. The last three weeks of remote learning they were instructed to limit their paper usage in the packets, so science was reduced to one page in their packet. Kelly explained this was not like their classroom instruction in science. They engaged in hands-on activities, lab experiments, and investigations throughout the year. "We had to do what we could do on paper, and unfortunately science and social studies took an instructional hit." (18)

Kelly began the Fall 2020 semester in a new district in a small town in Texas teaching 3rd grade science. While the safety restrictions for onsite learning still prevent certain activities, they have been able to do more hands-on learning and activities than she expected. Kelly uses the *Science Fusion* series from *Think Central* as the purchased curricular resource for science this year. She works to gather all the materials she needs for the investigations and activities, as they are not part of the curricular materials. She has four rotations of science, each 75 minutes long, with 15 to 18 students in each class rotation. As part of the district's onsite and virtual learning options, Kelly teaches the science to the virtual learners each day through a live-streamed lesson of an onsite class. An aide travels to each of the four third-grade classes to stream and record the lessons each day in each subject. Kelly has arranged her classroom to give the aide a designated area for filming that will allow her to capture Kelly as she's teaching, anything written on the board, anything projected on the screen, and any demonstration or experiment that may be done. Virtual learners log in during the science time and participate alongside the onsite learners

as much as possible. If a hands-on activity is planned, Kelly will provide them with lists of materials or suggested items they could use to do at home if possible. Otherwise, they watch the investigation, record their own observations, and draw their own conclusions based on the video of the class.

Kelly's classes begin with a warm-up activity that might involve a video or question to spark their thinking about the day's concept. Virtual learners completed this through *Google Classroom*. After a brief discussion of the warm-up activity, they will begin the lesson which could include a lab experiment, hands-on exploration or investigation, writing a lab report of the previous day's experiment, introducing or reviewing vocabulary, and tests every three weeks. Her first unit engaged learners in science safety, procedures, tools, and how scientists use information. They explored what it means to think like a scientist, what scientists do, and made connections to science careers. They used an experiment of a floating egg to practice making and recording observations. They expanded on these ideas with physical characteristics of objects and made observations based on these characteristics. Then they considered physical changes to objects and demonstrated their understanding of these changes using an investigation with paper. At the conclusion of this investigation, students were challenged to physically change the paper into a paper airplane and compare how their changes affected the distance the airplanes would fly.

Kelly explained that they spent time in the first few weeks of school reviewing science concepts from previous grades as a means of assessing their science understanding and any gaps that may be present moving forward. Students have engaged in investigations with matter and its characteristics, exploring how some items sink while others float, and changes in matter. They have used different units of measure to make observations and collect data about objects. They

have explored sound and light and will move into concepts around energy. Kelly is working on a plan to design small group instruction and student stations in the upcoming weeks. “Stations are an important instructional method for me, and I can interact with students in smaller groups.”

(I10) Stations allowed her to address gaps in science learning in small group instruction, while continuing student exploration and research in the concepts in smaller working groups. “Students will have to wear masks as they work in the stations, but they appreciate getting to move around more in my class.” (I10) Utilizing the small groups and stations method will allow her to capitalize on the limited materials she has and address more learning needs in the process.

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

With an extended Spring Break granted for the entire state of Texas, Kelly’s team used the extension to prepare their first week of remote learning. While they had been asked to prepare their learning online through *Google Classroom*, they also prepared paper packets that mirrored the work shared in *Google Classroom*. Per school leadership, they were to create an assignment checklist for each week that would give them the equivalent of 45 minutes of daily instruction in ELA and mathematics. Science and social studies were combined and alternated instructional days: 30-45 minutes of science on Mondays and Wednesdays; 30-45 minutes of Social Studies on Tuesdays and Thursdays, with Friday being a combined science and social studies time. Students also received a weekly calendar from their PE teacher in the packet.

Students were to pick up their packets from the front of the school building on Mondays and return their previous packets at the same time on Mondays. If they were using the online platform, they had all week to complete and submit their assignments. Kelly’s team continued

forward with their curricular instruction in ELA and mathematics, while science and social studies reviewed previously learned concepts. Getting their instruction started online was a challenging experience.

It was very difficult to get started because our campus isn't as tech savvy as other districts I've worked in. It's also very difficult to do things online because a lot of our kids do not have access to computers and the internet is slow moving or slim to none. It was also difficult because they've [students] never really had to use it independently before, we've always done it together as a class. (I1)

Communication with Parents: Issues and Opportunities

Kelly had work hours consistent with her school hours, being available to respond to parents at most times throughout the day, and even during the evenings. Kelly used *Class Dojo*, a class community messaging application, to communicate with her parents during the remote learning period. Their team had this system established prior to the remote learning, and they only had five of their 60 students' parents not connected. Kelly communicated with those parents as she could through email and phone calls. They had one student they were not able to reach, so her assistant principal made a home visit to check on this family.

The first two weeks of the remote learning period, Kelly felt like they were “flooded with parent questions and messages. It was a madhouse.” (I2) By Week Three, Kelly commented that “the parent frustration levels have decreased now that they know the expectations.” She also explained that parents gave feedback regarding instructional modifications the school had made between Weeks Two and Three and many of them were “feeling much better about the situation...not as stressed or overwhelmed.” (I3) Many of the parents became frustrated with internet service issues and requested paper packets for their students instead of online learning.

The internet service out here is not great. Even when I was on my virtual staff meeting, I kept losing the hotspot and I'd have to get back on. It was a pain. So, I could see why parents would feel that way. (I3)

Student Engagement and Participation during Remote Learning

Kelly expressed frustration in determining the degree of student engagement in their remote learning experience, since most of her students were working with paper packets at home. In Week Two, Kelly shared that most of the students had returned their first week's packet, but "we're finding they are not all complete." This sentiment was shared often throughout the interview process. Week Five brought even more added frustration with this process because she said, "there were a ton of packets with no names or identification on them. It was a mess!" "I really do wish more kids were doing it online because it's easier to grade. I hate having piles of papers. It's overwhelming." (I4) The amount of paperwork involved in checking their packets was overwhelming as well as difficult, because she did not know how much of it was the student's work and how much of it was done by the parent or with significant parental assistance.

You have the ones where you can tell the parents care and have sat with them to make sure it's been done. Those are great, but you can see a difference. You can see the ones who have no parent support, and you can say, 'well, they attempted, but they don't really understand what they did.' (I4)

Kelly stayed in touch with students through their *Class Dojo* messaging system, sending them daily messages and often video messages to tell them she missed them or share a fun story from home. Kelly also held specific hours on Monday and Wednesday each week where she was available in *Google Meet* to any of her students who had questions or needed assistance. She would open the meeting from 10:00am to 11:00am and was available for any student to join at any time. She had an average of three students each week participate in these sessions.

Administrative Expectations and Support Provided during Remote Learning

Kelly's district's interim superintendent was very supportive and encouraging to the teachers and students throughout the experience. She remarked that he was good about sending emails each week to encourage them and he even wrote and performed a song about the coronavirus in one of his emails.

Kelly's principal was ill during most of their remote learning experience, but her assistant principal stepped up and was available to them at any point. He helped her team contact a student's family through a home visit and established a structure for the teachers to submit records of their parent contact throughout the experience so he could assist if necessary. They had weekly virtual staff meetings and they were encouraged to "take time for themselves and walk away from the computers at night." (I2)

Her team worked well together, meeting twice a week at their building to plan and prepare their lessons and paper packets. They planned alongside another fourth-grade team and provided one consistent plan for all of fourth grade for their weekly lessons. They had assigned duties with the planning and distribution of the packets. Some of them put the packets together while others were at the building each week for distribution to the students. During Week Three, they had a slight scare, finding out one of their teammates had been in contact with a positive COVID-19 case. They began mailing the paper packets to the students in week four, so there would be no physical interaction needed for pick-up of the packets.

Issues and Personal Learning Experiences with Technology

The district wanted teachers to use *Google Classroom* to deliver online learning during this experience, however, adjustments had to be made because so many of their students did not

have access to reliable internet. While her team did not have as many to choose the online option, they made the same assignments from the paper packets available through *Google Classroom*. Those who submitted their assignments online received immediate feedback and the option to redo their work. It was difficult for students to redo their work in *Google Classroom*, and they had some difficulties submitting some of the reading assignments that were in PDF. “My kids are having a hard time figuring out how to edit PDFs online and turn it in to me. Every time they turn it in, there’s no answers.” (I1) Kelly tried several different tricks to help the students with the PDFs but eventually had her students type their answers into a Google document and submit them. Their reading curriculum provided them a few options for assignments online, but students were not used to completing these independently. It took some time for them to learn the structures online.

The school provided laptops to those students who had adequate internet access to do online learning and needed a device at home. They had support from the district if they needed technology assistance. Kelly shared, “I’ve used *Google Classroom* in my class before, but it’s just totally different doing it this way. I’m not in the classroom and can’t answer questions for them.” (I7) She would have liked some refresher courses in using *Google Classroom* and other *Google Suite* applications. She did not encounter a lot of technology issues; however, she did have one student that was using the school computer inappropriately and it had to be removed from his possession.

Other Factors Influencing the Remote Learning Experience

Kelly did not find it difficult to balance her work and home life during this experience. In fact, she enjoyed the flexibility that working at home provided. “It’s been nice because I can do

things while I'm working and see my family a bit more than I usually would." (I3) She also felt lower stress levels during the remote learning period. While the beginning of the remote learning period was a bit stressful because of the unknown and new routines, she felt like she "had less stress doing it this way than when she's on campus. There's just so many requirements at school and we would have been testing, so my stress level would have been a lot higher." (I3) She was more relaxed at home and "got to wear whatever she wanted, even if that was her pajamas." (I4)

Having unclear expectations and not knowing exactly what remote learning instruction should look like caused some frustration for Kelly and her team.

If you don't have everybody on the same page, it just causes chaos. And it was different when we had our classes in our classroom, but now that we're having to be doing the exact same thing, it's a little frustrating and stressful when one person is trying to do something differently. (I2)

Their instructional expectations changed several times within the first few weeks of the remote learning period, which added to their frustration. These changes were made based on feedback from teachers and parents about the workload. She expressed the need to have "specific systems to be in place from the beginning so that everyone could be on the same page." (I8)

Kelly often spoke about her concerns with academic equity during the process. It was difficult to know if the child had completed their work, especially their grammar and reading tests, independently or with parent assistance. Some students submitted work that the parents had completed for them. "The parents wrote the answers for their child; you could tell because it wasn't their [student's] handwriting. So, how do you know that they're doing them by themselves? (I8) Besides the work that was submitted, she was concerned with the level of support that students were receiving at home.

It's sad for the ones who aren't getting support at home because if they would be at school, they would be getting it. I hate the fact that I'm not able to have them in a small group to work with those that need that extra help. (I5)

She missed the ability to support her students and provide the instructional assistance and accountability they needed. She thought many of the students became lazy and complacent during this experience and there wasn't much she could do about it. "When they're in school, you can hold them more accountable than you can this this way." (I6) "You can't force them [students] to do something, especially if you aren't there working with them." (I8) She also believed the district brushed over some of the struggling learner concerns at the end of the year. "It's hard to pass some of these kids on to fifth grade, because you know how they have been doing in class. I think they're being lenient because we had this last six weeks of online learning." (I6)

Kelly's Reflections on the Remote Learning Experience

Kelly missed the hugs and interactions she had with her students in the classroom. She struggled knowing that they were "dumbing down the assignments to reduce the workload and support the parents who were struggling with all of it." (I5) She also knew the students weren't getting the same level of instruction as they would receive in the classroom. The students struggled with motivation to complete their work and they missed being at school with their friends. She is not a fan of the remote learning method and said, "I dread the day that virtual learning is all we do. I hope and pray our jobs are not put on the line because of this experience." (I5)

One of the highlights of the experience for Kelly was having the flexibility to set her own working hours. She appreciated being able to be flexible and not have to keep strict 8:00am-

4:00pm hours. She enjoyed being home and around her family more. She was able to do laundry and cooking in between times that she was available online.

Kelly shared her biggest obstacle during the experience was trying to work with the technology at the beginning. The reading curriculum PDFs were a source of frustration for her and the students. She struggled with being able to utilize their curriculum materials appropriately online. She also said it was “difficult getting in touch with students who hadn’t submitted any of their work. Sometimes we did not have a way to contact the parents and that was frustrating.”

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Kelly felt somewhat prepared to administer instruction during the remote learning experience. She understood *Google Classroom* and had used it some, but said, “there’s a lot more like *Google Slides* and *Forms* that I did not know how to use.” She would have liked more training with these tools. She did not feel as prepared when it came to understanding the expectations of what students should be doing and how they were to administer grades during the experience. She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Provide training to teachers in the Google Suite applications they are expected to use.
- Specific systems and expectations should be in place from the beginning, not thrown at them during the experience.
- Continue to use virtual staff meetings, as these kept teachers updated and on the same page.
- Provide study skills practice for students to help encourage better motivation
- Have a school-wide system of communication and expectations for communication with parents.
- Ensure all parents have access to the specified form of communication and know how to use it.
- Ensure parents understand the teachers have an ‘open-door policy’ even during remote learning and know how to get in touch with their child’s teacher.

As she reflected on the spring remote learning experience, she hopes that parents have a new perspective on how teachers support their children in school. “I hope people see what a value teachers really are.” (I8) She hopes that this form of virtual learning does not replace the in-person teaching and does not become the prevalent form of instruction.

Transition Back to School in Fall 2020

Kelly moved across Texas during the summer and started teaching in an even smaller district, located in a rural area. Her school serves pre-kindergarten through eighth grade with an enrollment of 697 students and 65% free or reduced lunch eligibility. The district offered both onsite and virtual options to students. Kelly said, “if they chose virtual learning, they had to agree to have a printer at home. Students could check out a laptop but needed to provide their own printer.” (I10) The printer allowed them to print specific materials that would not have been easily completed online. Fourteen out of the 66 third graders started the school year with the virtual option. At the time of our last interview, they had six students participating in the virtual option.

The virtual option requires students to be present at four live video conference sessions where they watch a live stream of an onsite class. While there is a dedicated virtual homeroom teacher, the subject area instruction is provided by Kelly and her teammates through the live stream session. An aide travels to each of their classes throughout the day and records and live streams the class sessions for the virtual learners. The teacher assigned to virtual learning does all the record keeping and typical duties of a classroom teacher for the virtual environment. Kelly appreciates how this district is handling the virtual learning option and wishes her spring

experience would have been more like this method. “I’m actually teaching them in the virtual classroom. It’s not paper packets. They are being held accountable for their work.” (I10)

Kelly’s Perceptions of Future Implications from this Experience

When talking about how this experience might impact the future of education, Kelly expressed her concerns about the future of teachers. “I hope they don’t do away with [onsite] teachers. Kids need the rapport and onsite time.” (I10) She has noticed a greater emphasis on using technology with the students and believes this could be a beneficial tool in certain situations. “I can see how using *Google Classroom* would be a great tool for one-on-one work with students or with tutoring experiences.” (I10) The experience in the spring brought forth changes in the fall virtual learning experiences, much to the surprise of many students and parents. “They have more accountability in the virtual environment this fall. I see more of my virtual students owning their work and their parents are following our expectations of when to offer help and when to step back.” (I10)

8. Julie's Story of Pandemic Induced Remote Learning

Background and Context

Julie taught fifth grade in a district located in a small city in Arkansas. Her elementary school serves kindergarten through fifth grade with an enrollment of 751 students and 11% free or reduced lunch eligibility. Julie had been teaching for 32 years, and she had 22 students in Spring of 2020. Julie had no prior experience with delivering instruction for remote learning.

Her district began preparations for the possibility of remote learning the week of March 9th, asking teachers to have 10 days of Alternate Methods of Instruction (AMI) work ready to send home in case of school closure. The literacy and mathematics facilitators at Julie's school created the 10 days of plans for all the grade levels, giving "uniformity and consistency across the grade levels to support parents." (I1) Remote learning procedures began on Monday, March 16, 2020. The district allowed the teachers and schools to choose their delivery methods, with some schools opting for all digital, some opting for all paper packets, and some doing a combination of both. Julie's principal sent a survey regarding access to the internet and devices and it was determined their campus would do online delivery of the remote learning. They were one-to-one with technology in the classroom and most students had access to devices at home. For those who needed a device, Chromebooks were checked-out for their use during remote learning.

Science Instruction in Remote Learning Compared to Science Classroom Instruction

Science instruction during remote learning was minimal and focused on reviewing concepts they had previously learned because they did not have any new science standards paced in the fourth quarter. Following the district's scope and sequence pacing, fifth grade alternated instruction in science and social studies each quarter, with the fourth quarter focusing on

standards in social studies. Julie mentioned several times throughout the interview process that they were told to focus on literacy and mathematics.

When science was included in their remote learning plans, they used a variety of resources to engage the students in reviewing the concepts. The first two weeks of remote learning, they finished up some of the science they were working on when school closed. This was assigned to them through the *Discovery Education* techbook platform, their district adopted science curricular resource. They assigned students segments from *Discovery Education* that they completed independently. During Week Five, students engaged in activities around Earth Day and environmental citizenship. Students watched videos, read articles, and learned about the history of Earth Day. Then they wrote letters to the mayor about recycling efforts in the community. They also engaged in nature walks with their families. In Week Six, students reviewed the water cycle using interactive models. They connected this to their weekly theme of ‘April showers bring May flowers.’ Julie explained, “this was not a grade-level standard, we were trying to find something that would get them connected in science to our weekly theme.”

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When asked how the science instruction during remote learning compared to her on-site classroom instruction, she explained how this year’s instruction looked different from previous years when they had departmentalized.

In the past, we’d switch classes and each of us teach a different subject. There was dedicated time to teach it. This year, a lot of it was student directed. We assigned them their work through Discovery Ed and told them where they should be. I would look at their work when I could. We tried to do one day of experiments because we had the Toolbox [large open meeting room] we could use again. We would add some videos along with it, but we did not have a lot of direct instruction. (18)

Science was one of the last subjects they planned as a grade level each week.

Science instruction this fall “is non-existent” according to Julie in the fall follow-up interview. “Right now, we're doing small group instruction during that time because of what we need to fill in for mathematics and literacy. So, I feel like it's getting shoved to the back.” (I10) They have been told that literacy and mathematics are the focus this year, and that their literacy curriculum has science and social studies embedded. “Basically, right now, all we're hearing is mathematics and literacy. You know, I mean, I hate that. But that's kind of what the focus is.” (I10) Their first unit is about patterns in the night sky and she has tried to add some science instruction through independent learning with *Discovery Education*, but she “hasn’t gotten very far with that yet.” (I10) Due to COVID safety restrictions, they are limited in the type of work they do.

Normally, we would start by building parachutes and exploring how they fall, but we can’t do any of that. We can’t meet in a big group or do group work. You have to be very careful where you are and that materials get cleaned after use. (I10)

When asked about how they will address gaps in students’ science learning, Julie replied,

To be honest, I don't know what it [science instruction] looks like in fourth grade. I really don't know how much was done. So, to me, honestly, with a lot of science, if a kid's a good reader, and has a good curriculum, it's not that hard to catch up. (I10)

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

Julie’s district allowed schools and teachers choice with their remote learning delivery methods. Julie’s school decided to use online delivery methods, and Julie’s team chose *Google Classroom* as their delivery platform. The lessons for the first 10 days were designed by their building literacy and mathematics facilitators to provide consistency across the grade levels. This gave the teams a starting place for the following weeks. Her team split the planning duties, and

each took a subject: mathematics, literacy, or science and social studies, with Julie planning mathematics. They used a *Google Slide* deck to share all the lessons and accompanying resources with students each week.

Communication with Parents: Issues and Opportunities

Julie used *Remind*, a messaging application, to communicate with her parents during the remote learning period. This was a tool she was already using, and parents were familiar with prior to remote learning. She sent messages every morning about the day's activities and a message in the afternoon to wrap up the school day. The afternoon message included an interaction question about what the students had done during the day. She also sent reminders about their class *Zoom* meetings through this system. A positive to using this system was that it offered analytics to know how many have viewed the messages. A drawback to using this system was that "you're limited on how many characters you can have. So, a couple of times I had to attach a document to my message." (I2)

Communication during the first few weeks was mainly around technological issues. Her students had used *Google Classroom* and were able to navigate their Chromebooks, so the questions typically rose from issues with security or privacy settings that prevented student access to their resources. As parents and students learned their routines, the questions from parents slowed down. Julie continued her daily messages and communicated with parents as they needed. She tried to remain cognizant of the situations that students may be in and worked hard to support parents during this time. "It's a new world for all of us. We can't control the environment the students are in now." (I1) Her team was constantly monitoring the feedback from parents and adjusted their instructional expectations throughout the experience. "I think we

have to keep asking our parents, *what's working for you and what's not working*. Lord knows I don't want to be the person to add any more stress to their lives.” (I2) Based on parent feedback in the first few weeks, they reduced the daily student work time from three hours to two hours, and their whole class meetings and small group meetings counted as portions of that work time. “Not all of the parents liked how much we were giving the students and others thought it wasn’t enough.” (I4) In Week One, Julie addressed similar concerns saying, “the bottom line, it’s got to be what's best for kids. Not necessarily what's best for the teacher or what's best for the parent, but what's best for the kids.”

Student Engagement and Participation during Remote Learning

Julie held class meetings every morning, for 30 minutes to an hour, using the videoconference tool, *Zoom*. This time was completely devoted to the students’ social and emotional needs. They carried over their classroom structure from their morning meetings and shared celebrations and concerns every morning. She included a variety of activities to allow students to chat and laugh together. They had group show and tell days, scavenger hunt days, posed ‘would you rather’ questions and allowed them time to talk to each other. “These kids are so digital. They’re on with each other all the time, so I just felt like I facilitated it and they carried on.” (I1) In Week Six, her team decided to do a grade-level *Zoom* meeting, giving students a chance to mingle with all their friends in fifth grade. A surprise came that day when one of their students, who was battling cancer and had not been in school for quite a while, joined them on their *Zoom* meeting. They allowed him to share about his journey for about five minutes at the beginning of the call. “That was a special experience for our students.” (I6)

Julie's students consistently attended their class *Zoom* meetings, with 18 to 20 students each day until Week Seven. Participation in the last few weeks dropped and Julie attributed that to several things: beautiful weather, end of school 'senioritis' feelings, and the students being done with this experience. "Everyone is over it." (I8) While students may not have attended the class *Zoom* meetings, they were submitting their work each day. Julie reported that all but one student consistently completed their work during the nine weeks of remote learning in spring 2020. (I6; I9)

Julie shared stories of students who were contacting her during the last few weeks of remote learning, concerned about going to middle school and concerned they might not be ready.

I noticed a shift in the students this week. They are worried about what they are missing before going to middle school. Everyone knows this is coming to an end. There is a large group of them out there that's worried about what they're missing. And I said, 'Guys, it's not just you, everybody's missing it. So, it's a very level playing field.' And after I said that to a couple of them, they were like, 'Oh, so yeah, that makes sense. And I said, you know, your sixth-grade teachers know that you had eLearning for a quarter. So, everybody's going to be on the same page at the beginning of the year.' But it's so funny that the shift happened with them. I mean, I did not do anything different. (I7)

Administrative Expectations and Support Provided during Remote Learning

There wasn't an interview in the process that Julie did not talk about her principal and share stories of how she was encouraging and supporting the staff each week. When her principal found out teachers were struggling with audio issues on *Zoom* calls, she purchased them all a set of headphones with a microphone. When she found out that some of the teachers were having issues with unstable internet connections, she got them remote hot spots. When the teachers needed a way to record lessons, she purchased a school license for *Screencastify*. "I feel that anything we need or ask for, within reason and power, would be granted or supported by her

[principal].” (I2) Her principal held weekly faculty meetings and leadership team meetings where she would disseminate information. “Our principal is very transparent. We all know her expectations. She is a great disseminator of information.” (I2) Her principal provided perspective and often encouraged Julie to give herself grace.

The district superintendent provided updates and messages of encouragement to the teachers throughout the experience. The principals and other administrators were updated throughout the experience in weekly meetings and those updates would be shared within their weekly faculty meetings or in their leadership team meetings. While there were not established district guidelines, her principal set expectations for their school and their daily instruction online, asking teachers to have two hours of instruction each day, including *Zoom* meetings.

Our principal kept saying, ‘we need one of those zooms or small groups to be academic.’ And so, we’re, we’re busting our heads going, ‘Okay, how do we make that happen?’ Well, in PLC this week, our principal asked, ‘how are things going?’ and we said, ‘there’s nothing academic going on’ and she said, ‘your academic is your social-emotional right now. And that is okay. If you are spending 15 minutes engaging with those students asking them how their day is going and asking them how the work is going,’ she said, ‘that is perfectly fine.’ (I4)

Julie said she “felt like another weight was lifted from our shoulders” (I4) after this affirmation from her principal.

Julie’s team worked well together both before and during the remote learning. They divided up planning responsibilities and taught each other different technology skills along the way. Julie shared, “collaboration in this situation is hard, but our team processes together and we support each other.” (I6) One of her teammates had previous experience in a virtual learning situation and Julie said, “her insight has been very helpful.” (I2)

Other instructional support was provided by her campus literacy and mathematics facilitators, especially during the first two weeks of the experience by putting together their first 10 days of work. Their support changed a bit after the initial start and Julie said, “if I were to ask them for something, they would do it. But what I really want is for them to do something and share it without me having to ask for it.” (I2)

Issues and Personal Learning Experiences with Technology

Students who needed access to a device could come to their school and check out a Chromebook for the duration of the remote learning. The district technology department also provided levels of support to parents, students, and teachers throughout the experience. When she had an issue with her Chromebook, the department replaced it for her within a day. The technology curriculum specialists offered a variety of professional learning sessions and support meetings during the experience too.

Multiple issues with technology plagued Julie’s remote learning experience. Julie used a school-issued Chromebook, like her students, so she could have a frame of reference when parents or students contacted her with questions. She had issues with storage and settings on the Chromebook that made it difficult for her to conduct her daily business. When she contacted the technology department for a replacement, she learned she had one of the older Chromebooks that should have already been replaced. The new device made things easier. Her device wasn’t the only issue though. Julie also had difficulties with her home internet access and shared about these struggles in several of our interviews:

The internet has been very frustrating this week with slow service. (I3)

Technology let me down at several points during the week. (I5)

Technology has been my nemesis this week in all my meetings. The internet is not great. I was kicked off meetings and had to rejoin several times. (I7)

Her team encountered new problems each week with the links they were sharing with their students. There were several resources that were blocked by district security services and they had to contact the technology department to release the settings. Sharing permissions in *Google Suite* presented issues on a weekly basis. “We had a lot of trouble linking videos in our *Google Slides* and some issues with video links and permissions sharing. I spent most of Tuesday troubleshooting.” (I3)

These struggles with technology often left Julie feeling inadequate in her knowledge and use of technology. “I start feeling my age and my lack of knowledge, and then I start flapping, which is all silly, because if I’ll just calm down, I’ll figure out.” (I5) She watched and learned from her teammates who had a bit more experience with digital tools. She researched privacy settings and controls for her *Zoom* meetings and spent time learning new programs and features that would help her with the remote learning experience. “I started fretting about providing new instruction for my students. So, I spent a lot of time on Thursday and Friday researching and figuring out *Screencastify*.” (I2)

Other Factors Influencing the Remote Learning Experience

Julie did not express many issues with finding balance between her home and work life. She often shared stories about the struggles her daughter, who is also a teacher, had balancing life with a five-year old at home, but Julie found ways to balance her work and home life, allowing her down-time with her husband in the evenings and on the weekends. She did struggle with the constant lure of the computer:

It is really hard to turn off. I think that's the thing. It is hard to turn off. You know, at least when you get in your car and leave the physical building, you can kind of shut down. I try to get myself out of the house and walk every day to try to at least get away from it from a little while. But every time I walk by this computer or by this room, I think, *I could do this, or I could do that*. So, the turning off is hard. (I2)

Her efforts to communicate and respond to parents, even in the evenings, were like what she would give during a normal school day. “On any normal day in school, I would do that too. I want to make sure that I give opportunities to parents that are working to interact and respond as well.” (I2) Julie said she was “working her tail end off” in preparing for each day with the eLearning:

I think that because I've been teaching for so long, I fly by the seat of my pants so much in the classroom. There is no flying by the seat of your pants with eLearning. It all has to be there and ready. (I2)

Julie also struggled with feelings of inadequacy, about her level of tech-savviness, feeling as if she wasn't teaching, and wondering if she was doing enough. Seeing posts shared on social media by other teachers would lead to a comparison of what she was doing.

Even though I know how to use *Google Classroom*, watching other people, and I know I should stay off Facebook, but you know, social media is the only way to go; I'd be seeing all these other things that people are doing. Then I started feeling inadequate. By the time I got to my students on Monday morning, and they all were there, and we resumed, I thought, ‘you were okay. We're really okay.’ (I2)

This doesn't feel like teaching, and my daughter and I keep having that conversation. I keep talking her off the ledge. Because we compare ourselves to what we see on Facebook or what we see on Instagram. And, you know, this is not a time for comparison. And I keep saying, ‘I don't feel like a teacher. I feel like an aide who's passing out work.’ (I4)

Even though she was “bone tired and worn out at the end of the day,” she often felt as if she wasn't doing enough for her students or as a teacher. (I2) “It's an odd feeling. Do I really feel like a teacher? I'm not sure, but it's a different lens. It's a different kind of teaching if that makes sense.” (I4) She reiterated this feeling the following week:

I still don't feel like I'm teaching anything. I feel inadequate for these students. I think my inadequacy is probably a lot just in my head. But I like interaction. I think that I feed off the students' interaction in the classroom, and that helps me to be a better teacher. It obviously helps guide my instruction because I know where to go next. (I5)

Julie shared during our first interview that she believed “because of our school’s population, we have to provide a better product digitally than what we are doing right now because these parents have options.” The pressure to maintain the highest level of instruction throughout this experience was a heavy burden for Julie.

So, we especially, have to look at what we're doing and prove that we can't be replaced by the computer and prove that we have some knowledge, you know. I think our population sees their options. I don't think any of them want to keep their kids at home. They're ready to get rid of them. But you know, we do serve a purpose. (I1)

She also felt the pressure to give feedback on every assignment that was being submitted, and often found herself worn out from this internal pressure. “To me, feedback is more important than anything. I was trying to check every kid’s work, every day and that was wearing me out.” (I3) After discussing some concerns with her principal, she was encouraged to reflect on the work they were assigning and determine the level of feedback truly needed for each assignment. Her team reflected on this and Julie said they realized “we are working too hard. We are making this too hard on ourselves.” (I3) Julie continued to work on her efforts with feedback and in week seven told me, “as far as the feedback, that’s what I’ve really been trying to master and figure out.” While Julie was continually learning and working on honing her skills, she still found it difficult to move beyond some of these thoughts of inadequacy, remarking, “we’re giving our students grace, so why can’t I give myself grace?” (I5) Being able to step back and recognize all she was doing for students and the amount of learning she was experiencing was difficult for Julie.

Julie's Reflections on the Remote Learning Experience

The remote learning experience provided new perspectives about teaching and learning for Julie. She recognized the importance of continuing the learning process, both for her students and herself. “As a teacher that knows what I'm doing in the classroom, I know that I have to keep going in this situation. I can't just give them review. I know that and I'm stretching myself.” (I1) She knew that the “online classroom would not mirror our classroom” but she wanted to ensure that her students were still learning throughout the process. (I1; 19) She recognized she doesn't know as much about technology as she needs to know and looks forward to learning more about integrating in her classroom. She appreciated learning the online methods and recognized the benefits it could afford her in the classroom.

It's so much easier to read their work online and have it all in one place, having the ability to give and receive feedback right there. I can see using this and teaching it this way next year, teaching the process of reading, returning, and revising. (I7)

One of the highlights of the experience was being able to make deeper connections with several of her students that she would not have made in the classroom. Julie got to see a different side of her students in their class *Zoom* meetings. She said, “several of my students who were quiet in the classroom participated more in the *Zoom* meetings.” (I9) She enjoyed laughing with them, seeing their home environments, and getting to be with them in a more relaxed manner. Another highlight was the amount of learning around technology, stating, “I know a heck of a lot more about technology than I did before, learning all kinds of things, like Google, *Zoom*, and *Screencastify*.” (I9)

Even though learning more about technology was a highlight of the experience, technology was also one of her obstacles in the experience. The technology was frustrating at

times, and she did not always know how to help her students when they had problems. Another obstacle was struggling to implement all the elements of their curriculum online, especially when those elements weren't digital or couldn't be digitized easily. Much of the instruction she was used to delivering required active learning strategies and resources that were not created to be delivered online. She found it difficult to continue their reading curriculum online when she did not have the books in her hands and in the hands of her students. The collaborative nature of learning was difficult to recreate in the virtual setting. Julie explained, "we turn and talk to a partner in almost every piece of a lesson, so that collaboration within the classroom was really missing. We did not manage to reconstruct that virtually." (I9) One other obstacle was her struggle with feedback in the virtual setting.

I feel like that piece was missing as well. Because, you know, in the classroom, you're walking around saying 'no, do this or what are you thinking or explain this to me,' where I couldn't do that in this setting. I would comment on their *Google Classroom* and then I would talk to them, but I don't feel I was successful with feedback. (I9)

Julie felt like they were "as prepared as they could be" for administering instruction during remote learning and received the support she needed throughout the experience.

We did the best we could with what we had. I feel like it was a win. I think we were as prepared as we could be. And throughout the time, I was given all kinds of help. All I had to do was ask, you know. I got a new computer. I got technology support if I needed it. So, I felt very supported from a district perspective, and as well as from my principal because all I had to do was ask. (I9)

While she felt a sense of preparedness, she believed there was room for improvement. She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Ensure teachers have reliable technology. Every teacher needs to have their own laptop if we are going to continue in this manner.

- Establish consistent methods for communicating to parents. If there is not a district-wide method, then our school, at least, needs to have consistency across the board.
- Provide opportunities for teachers to learn and use various technology resources. We need to know what is available and how we use with our students before trying to use it with our students.
- Implement the use of technology earlier and more consistently with our students.
- Ensure our parents know how to be part of the communication loop and what is expected of the students.
- Host a “back to school” night with technology embedded so the parents understand what the students will be doing and how to help them, if needed.

Julie shared that her district had already announced they would be using *Google Classroom* as a district-wide platform beginning in the fall, and their technology curriculum specialists would have multiple professional learning opportunities available for them throughout the summer.

As she reflected on the spring remote learning experience, she expressed concerns about the students’ well-being and if this experience was worth their time and effort.

I know we're going to really have to think about their heads and their emotional place when they get back where they are. They've been out for 6 to 8 months, whatever, and the stamina, all that. We're really going to have to look at it again and revisit how we build community. Although that's always a back to school thing anyway, but I think it's going to be, well, I don't think we know yet how it has affected them, and what we're going to have to deal with. (I9)

In my head, I keep going back and forth. Was it a waste of time? Was it just busy work? You know, what really did we get out of it? (I9)

These wavering thoughts about if their time was well spent and if it was beneficial led Julie to have conflicting thoughts about the effectiveness of the remote learning experience too.

I waver in my thoughts. If I'm measuring academically, I'm thinking it's not effective. But then when I step back and look at what they're doing and how they're connecting things in the experience, and it seems effective. So, the real shift is probably in my perception of what they're doing. (I7)

The kids are resilient. I just wonder at what cost to them. I mean, I know that we keep saying it's costing us a lot. But what's it costing them? I don't know. (I10)

Transition Back to School in Fall 2020

Julie's district returned to school, both on-site and virtually, on August 24, 2020. Parents had the option to choose whether their student would return to school onsite or participate in virtual learning. They were asked to submit their choice and stay with this option for at least a quarter, even though some have been allowed to shift.

Due to COVID safety restrictions, they have many new procedures and strict time schedules they must follow. Julie said, "my schedule is tough with large groups of being-in-the-classroom time." (I10) She expressed frustration with the loss of instructional time because of "all the mask breaks and movement in between them." She is not fond of the classroom arrangement requirements stating, "the classroom looks like a 1950's classroom with the desks in rows and all spread out." (I10) They are not able to have group work, but they have been able to find some ways to do partner work for short periods of time. While she is struggling with many of these restrictions, the students are doing well considering the circumstances. "The kids were very happy to see each other and they've all gotten along; no drama, no nothing, which is a little surprising. Being that they're just stuck with their classroom and they don't get to talk to everybody else." (I10)

Julie said the word of the year is "pivot." "We keep hearing we have to be ready to pivot." (I10) Their professional development at the beginning of the current year was designed to support them in case they found themselves in another remote learning situation. Their building implemented procedures to ensure all students would have access to any materials they would need for instructional experiences both in the classroom and for at home learning. The students all have a personal supply bin that contains their reading books, workbooks, manipulatives, and

any needed supplies. They use these each day at school, and if they needed to pivot, students could take these home or parents could come retrieve them. They are using *Google Classroom* and started this day one. Their assignments can be digitally pushed out if students are absent, allowing students to stay caught up with the class and not fall behind. The district also purchased Dell laptops for every teacher, with the expectation that the laptop would travel back and forth with the teachers, keeping them connected if they found themselves having to pivot. Her principal implemented a school-wide communication tool that allows multiple levels of access and communication. Their principal has access to communicate to all the parents, grade levels, classes, or parents individually. Teachers have a variety of ways to communicate to groups of parents, and it also allowed them to facilitate the scheduling of virtual parent-teacher conferences within the application. “The use of this tool for communication has been good for our school.”

(I10)

Other struggles with the transition back to school involve the gaps they are seeing in student learning and struggles with new curriculum being implemented this fall. Here are some of the thoughts she expressed about the gaps in student learning:

You know how we talk about the ‘summer slide.’ Another thing I can really speak to is the “COVID slide.” Holy Toledo. I have 21 students, and I had only four or maybe five students who went up in their literacy scores, everybody else went down in their scores. And our high kids that were way above grade level last year, now they've gone down to grade level.

Math is a little different. The students are showing good relational thinking in their fluency assessments. But the hard part is that with the new curriculum, I don't really know what's coming next, and I don't always know where to go. The curriculum starts with area volume and we know the fourth-grade teachers did not get to all the measurement standards last year. So, they've missed that and it's taking us longer to get through volume.

I've been really fortunate because I have a full-time intern. So, we are grouping. We're doing small groups in the afternoon and she's hitting a mathematics group and I'm hitting the literacy end of it.

Julie's Perceptions of Future Implications from this Experience

Julie is already seeing implications from the experience on their instruction and back-to-school experiences this year. There has been an emphasis on the students' social and emotional learning this year. "We don't know how this experience will impact them yet. The kids are resilient. But I don't think we are going to know the ramification for a long time." (I10) Her perspective on what is important is shifting, saying "so many things that we've held important are not as important in the grand scheme. We've weeded out what's important and what's not important." (I10)

A lot of physical changes have been made to create safer environments and she can see some of these changes "sticking around until we're more normal." (I10) One of those changes is that all their meetings, big or small, are being held virtually, or the information is being shared in email.

You know that idea of 'this could have been done in an email' - well we're seeing that play out right now. We're not doing big staff meetings. We have *Zoom* meetings or emails with action items. I'm thinking in-personal faculty meetings may be a thing of the past. Which isn't necessarily a bad thing. (I10)

This change applied to their faculty meetings, district Monday meetings, professional development sessions, parent-teacher conferences, and many other typical events they would host throughout the year. Julie also discussed the learning options that parents were given this year, saying "I hope our district continues to keep the virtual option available after this year. I can see how it would be great for those parents who travel or need to move around often." (I10) While she does not want to be a virtual classroom teacher, she does see the benefits this type of

learning affords and knows that learning can happen anywhere. She has shared this belief since our first interview when she offered this analogy:

You know how we say the church is not the building, it's the people that make the church. Well, that's what I see here. The building is not the school. The teachers and the students and everyone that enters the building are the school, and school doesn't have to happen in that building.

9. Daisy's Story of Pandemic Induced Remote Learning

Background and Context

Daisy taught fifth grade in a district located in a small city in Arkansas. Her elementary school serves kindergarten through fifth grade with an enrollment of 565 students and 79% free or reduced lunch eligibility. Daisy had been teaching for 21 years, and she had 28 students in Spring of 2020. Daisy had no prior experience delivering instruction via remote methods.

Her district began preparations for the possibility of remote learning the week of March 9, 2020, asking teachers to have 10 days of Alternate Methods of Instruction (AMI) work ready to send home in case of school closure. Her team worked together to get the packet of work prepared, in both a digital and paper format. The digital format was shared through a Google Doc that had links to the reading passages and various activities for students. The paper packets had copies of the reading passages and activity sheets like those in the digital links. The paper packets were differentiated for her students who had IEPs and for those receiving ESOL services. They had packets ready to distribute on Friday, March 13th but were directed by a district administrator to hold on to them until further notice. They received notice that Sunday afternoon of the state-wide school closures and remote learning procedures began on Monday, March 16, 2020. Since packets were not distributed prior to the closure, the parents had to come up to school during the first week to pick up the packets for their students.

The district allowed the teachers and schools to choose their delivery methods, with some schools opting for all digital, some opting for all paper packets, and some doing a combination of both. Daisy's school used a combination of both digital learning and paper packets. Daisy had 23 out of 28 students who agreed to do digital learning.

Science Instruction in Remote Learning Compared to Science Classroom Instruction

Science instruction during remote learning was minimal because they were told to focus on literacy and mathematics during remote learning. During the first 10 days of remote learning, their packets contained reading passages and simple activities about Energy. Daisy mentioned that “the kids who got paper packets throughout remote learning had science activities in their packets. It was simple science to do at home, but at least it was something.” (I8) Science activities were linked digitally for a few weeks through the PBS streaming services that were provided by the Arkansas Department of Education for teachers to use with their remote learning. Students watched shows from *PBS Kids* that focused on central topics like bees and pollination. Daisy was able to have some discussions with students about the science content in their *Zoom* calls, stating, “on *Zoom* calls we would talk about what was happening outside with the pollen and I’d connect it to the PBS content.” (I8) She also shared a few science experiments during *Zoom* calls, hoping to keep the engagement alive with her students.

During Weeks Five and Six, Daisy presented a STEM research project focused on catapults and the Middle Ages. Students were challenged to design and test a catapult using materials from home. They were to test the catapult repeatedly to measure the distance their ‘boulder’ traveled and then make modifications to see if they could extend that distance. Students took pictures and videos of their experiences, and many involved their whole family in the activity, which was something Daisy was hoping would happen. Daisy shared the following story about one of those videos:

Oh my gosh, they went outside, and they were shooting the catapult. And the mom got involved. And she was like, ‘we have had so much fun trying different things on this catapult.’ They were shooting marshmallows and you could just hear them giggling. And they’re screaming, ‘it just hit the car!’ The whole family was involved and that’s what I had wanted. That’s what I had shared at the beginning of the week, telling them, ‘guys,

get your families involved in this. It's going to be fun.' You know, parents like to do this stuff, too. (I5)

The catapult activity generated family engagement for seven of her students and Daisy shared, "it's been neat to see the parents interact with their kids in this project. You don't know how they are dealing with all this." While Daisy had hoped that this project would spark more excitement with her students and increase participation in their schoolwork, it gave them an opportunity to integrate their science, mathematics, and literacy work over the course of two weeks.

When asked how the science instruction during remote learning compared to her on-site classroom instruction, she explained that science was part of their daily instructional schedule, except during the alternating weeks for social studies. Since she had moved up to fifth grade, the instruction was taking her a bit longer to work through because she wasn't as familiar with the content. She followed the district pacing and used *Discovery Education*, the district purchased curriculum. She elaborated on what that instruction looked like:

We would do a KLEWS chart [what we think we know, what we learned, our evidence of learning, our wonderings, and scientific terms] to start the unit and we would do our Engage. I use the five E's and we would engage and sometimes there was an experiment for them to try with that and sometimes there was reading or videos or something like that watch. And then we would do some articles after that to figure out more about the concept. I really liked doing the hands-on activities from Discovery Ed. If I could do the activities, like literally hands-on, we would do that instead. (I8)

Science instruction has not started yet this fall, as they are finishing a unit in social studies. She did share that "they've taken 20 minutes away from our science and social studies instructional time." They have been told that literacy and mathematics are the focus this year, and that their literacy curriculum has science and social studies embedded. Their first unit is about patterns in the night sky and they have already had some discussions about some of these

ideas with the read aloud they are doing in Reading. She also shared that hands-on science time will look different this year because of their safety restrictions.

I'm excited because we've been talking about some science stuff in our read aloud. There's a lot of references to the sky, so it's neat, because our first unit is about the patterns in the night sky. We're talking about how many full moons there are in a month, and I'm just kind of getting some lowdown of what they know versus what they don't know. I'm hearing some of the kids talk, saying that they are so excited for science to start. I think a lot of science did not happen while we were doing virtual learning. And, you know, science instruction is going to look a little bit different because there's not going to be a lot of hands-on science. There won't be group hands-on science, you know, where they get to work together with a group. If they make something, they can't do it together, they can't touch each other's stuff. This year, it's going to be individual, so they will have to make their own. They'll have to design their own thing. So, you know, working together and building stuff together and cooperating, that is not going to happen this year. I mean, just we just can't work together. (I10)

When asked about how they will address gaps in students' science learning, Daisy replied,

To be honest, I don't know. How will I know there's science gaps? I don't know exactly how I would address the science. The fourth quarter unit was energy, which is a big one. In fifth grade science, we don't do energy at all. I think that we'll just have to monitor and adjust as we're doing it. And if there was a concept or something taught last year, that you know, was supposed to be taught, and it wasn't because of the whole COVID thing, then I guess that's something that we'll just have to cover at that time. (I10)

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

Daisy's district allowed schools and teachers choice with their remote learning delivery methods and her school decided to use a combination of paper packets and online delivery methods. Daisy's team chose *Google Classroom* as their online delivery platform because they had used it in their classrooms. The lessons for the first 10 days were pulled together prior to the start of the remote learning experience and included worksheets, skills practice, and simple activities in literacy, mathematics, and science that could easily be completed at home. During

the first 10 days, they used similar activities for online learning, linking the reading passages and activities in a Google document that was shared through *Google Classroom*.

After the initial 10 days, Daisy's team divided up the planning and decided they would present the same material and lessons to all their fifth-grade students through their own *Google Classroom* and with their own delivery styles. They were told that their activities had to review concepts and they could not introduce new learning targets. "They said just keep reviewing, reviewing." (I3) At the end of Week Three, they were informed that the students who were receiving a paper packet would now receive a menu of activities, or a calendar of daily activities for the week. Parents would be expected to sign the menu each day to note the student completed the work. These menu activities had to be activities that could be done at home and could not require any copies to be made.

Communication with Parents: Issues and Opportunities

Daisy used *Class Dojo*, a class community messaging application, to communicate with her parents during the remote learning period. She used *Class Dojo* as her primary method for messaging parents, and she emailed or texted the few parents who weren't on their *Class Dojo* system because they had not authorized their phone number to be used for messaging services. This was a tool she was already using, and parents were familiar with prior to remote learning. She sent daily messages to parents, offering encouragement, shout-outs to students, and providing updates on their class work. She was intentional about the amount of communication being sent, saying, "I don't want to bombard my parents and stress them out." (I1). In Week Four, she began sending weekly progress reports to both parents and the students, updating them on the work that had or had not been completed for the week.

Communication during remote learning typically focused on parent concerns over the work their child needed to complete. She received messages from parents who did not trust their child was telling them the truth about their work and messages from parents who were shocked to find out their child had not been doing their work. This was a source of frustration, as the students had used *Google Classroom* prior to the remote learning, and they knew the routines. Early in the experience Daisy commented, “I try not to get frustrated because, again, the parents don't know what they don't know, and they are trusting their kids.” (I3) A few weeks later, Daisy found herself frustrated with the same situation:

It's frustrating, very frustrating. And, I try to remember, ‘this is what I can control, and this is what I can't.’ And it's like, parents, why aren't you seeing that you need to be guiding these kids doing their job. It doesn't need to come for me on a weekly report. I think there's a breakdown in what the parents think should be going on. (I6)

I'm getting *Class Dojo* messages at seven o'clock at night saying, ‘my kid says he has no homework.’ I'm thinking, ‘is this spring break? Of course, your child has work to do.’ And so, it's almost like I'm having to teach the parents and the kids. And it's not even something that I should have to teach them. I'm thinking, you know what, your kid has been like this all year. This is not something that's new. You should be able to look at his *Google Classroom* and see what needs to be done. It's not like this is a new thing. This is week six of online learning. (I6)

Daisy continued her daily messages, weekly progress reports, and communicated with parents as they needed. She noted a decline in parent communication that started in Week Seven and continued throughout the remainder of the experience, stating, “I think parents are tired of it, which I get. I get it. But what's going to happen next year? That's the concern with all this.” (I6) She expressed concerns that parents would blame their kid’s struggles or failures next year on the remote learning experience and not on the work or effort of their child. “I can honestly tell you that whenever we go back to school in the fall, these parents are going to be blaming the digital learning process on their kid’s failures. Yet, I am not seeing any work from them.” (I7)

Student Engagement and Participation during Remote Learning

Daisy held class meetings for her fifth graders every morning using the videoconference tool, *Zoom*. The meetings started out as a social-emotional outlet for the students. She included a variety of activities to allow students to chat and laugh together. She used this time to finish the book they had been reading aloud in class and started another book together. In Week Three, she started adding academic elements into the meetings, holding mathematics number talks, sharing the poetry students had created, playing games, and introducing logic puzzles.

Daisy had consistent participation in her *Zoom* calls throughout the week, ranging from 13 to 16 students on any given day. In week two, she realized that the time she had set for their meetings was the same time that many of them went to the bus stop to retrieve their lunches each day, so she quickly rearranged their meeting time so they would not have to miss the class meetings. Daisy enjoyed seeing the kids and their personalities shine through in these meetings, sharing, “the kids that are there are making it their time. They are getting comfortable in the environment and often don’t want to leave.” (I3) Daisy shared about her first experience on the *Zoom* calls:

It's bringing people together, more so than I ever thought it would. And to get to see my kids! Whenever I zoomed with them for the very first time on Monday, I got on and it was emotional. Some of them teared up because we hadn't seen each other in two weeks. And I mean, it was kind of emotional. I'm not going to lie. (I2)

Student participation in their work each week wasn’t as consistent as their participation in the *Zoom* calls. Her students did not always see the value in doing the work they were assigning and did not put forth a lot of effort. When she introduced their catapult STEM challenge and research project, she was shocked at the messages from students, sharing,

I had multiple, multiple emails or messages on *Google Classroom* that said, *do we have to do this?* I said, *yes, you do. It is an engagement piece. It is your reading assignment, and you need to do some research. And yes, you do need to build one.* The student replied, *well, I don't have the supplies* and I said, *do you have things in your house?* They said, *yeah*, so I told them they can figure out some way to make a catapult. I said, *I have not put any limitations on what you were to use. I said you can use anything.* (15)

While this attitude was frustrating, Daisy also recognized it was normal for this time of year, saying, “you know, it's the slump. It's the end of the semester slump and not very many kids are participating.” (16)

Administrative Expectations and Support Provided during Remote Learning

Daisy expressed gratitude to her principal and team for their support throughout the experience. She often spoke of the way her principal responded to their questions and needs and expressed how important her team was to her during this experience. The first few weeks of communication from her principal and other faculty meetings were a bit crazy and hard to keep up with at times. “There's been a lot of emails saying here's an option, here's another option, here's another option. I'm like, I can't keep up! So, by yesterday,...I'm getting an eye twitch; I'm going crazy.” (12) Emails eventually slowed down after expectations stopped changing so often. In week three, Daisy shared, “things are changing every day with how we're doing stuff.” Daisy expressed frustration with the changes and attributed them to the lack of district-wide expectations for remote learning.

The principals were updated throughout the experience in weekly meetings with district administration, and those updates would be shared within their team *Zoom* meetings or in emergency faculty *Zoom* meetings, as necessary. While there were no district guidelines for engagement and participation, her principal set a building expectation that they would engage students in more social-emotional learning and interactions rather than academic interactions.

Daisy's team worked well together both before and during the remote learning. They divided up planning responsibilities and taught each other different technology skills along the way. In Week Two, Daisy shared that a teammate had visited one of her *Zoom* meetings and "taught me several tricks to working in *Zoom*." She also expressed how much she appreciated how colleagues were working together. She collaborated with her Special Education resource teacher and her ESOL teacher several times during the remote learning experience and Daisy loved how "this experience is bringing colleagues together more than she ever thought." (I2)

Other instructional support was provided by her campus literacy and mathematics facilitators, offering resources for teachers throughout the experience and helping teachers plan activities as needed. Daisy's mathematics facilitator also joined her on some *Zoom* calls and hosted mathematics talks with her students. Support from the state level was given through their work with PBS and providing a series of streaming videos and related activities in literacy, mathematics, science, and social studies, for teachers to use in their remote learning. Daisy and her team used these resources several weeks during the remote learning period.

Issues and Personal Learning Experiences with Technology

Students who needed access to a device could come to their school and check out a Chromebook for the duration of the remote learning. Daisy had several students use this option. Some of her students had to go to the school parking lot or restaurant parking lots for access to Wi-Fi. Daisy mentioned in the beginning of the remote learning that some providers were offering free internet, but this was not necessarily the case and wasn't available in all areas. Daisy expressed concern with this situation, explaining that some students were logging on at odd hours, while others had to wait until parents came home from work to access their online

work. “I don’t know if they were sitting at the McDonald’s parking lot to do this, or were they sitting outside of our school building? I don’t know.” (I1)

She did not express many issues with technology or the platform during the experience. Early in the experience, they had struggles with student access to *YouTube*, which is how teachers were sharing the videos they were recording. Daisy explained the issue was with district permission settings: “interesting fact: if a student is using a [district issued] Chromebook, they can't go onto *YouTube*. It’s blocked. So, unless the video has been approved, they can’t view it. Guess when we figured that out...yesterday.” (I2) Daisy contacted the technology department and got the settings changed so the students could view their lessons. Other issues came with the occasional internet outage at Daisy’s house.

The experience brought new learning in the world of educational technology for Daisy. She was comfortable using *Google Classroom* as their platform but had never used *Zoom* before. She worked hard to learn the features of *Zoom* and practiced in real time with her students and teammates. By Week Two, she was exclaiming, “this week I became a *Zoom* Rockstar! I learned lots of things that I did not know before. My kids taught me stuff and then I jumped on [teammate’s] zoom call and taught her kids how to do it!” She often remarked about other programs she saw teachers sharing about during the experience, but she was careful to not overwhelm herself with expectations of learning and introducing new things. She decided she would focus on the things she knew and those the kids knew and get better with them. When reflecting in our Week Three interview, she shared,

I did things that I knew, and I just perfected getting better at *Zoom* and getting better at making it look like I knew what I was doing, you know. There are some things out there that I'm seeing on the AMI teachers Facebook group that I would really like to try. But I

think I had to get myself in the right frame of mind. And I had to get comfortable with what I was already doing in order to feel comfortable to try something new.

Other Factors Influencing the Remote Learning Experience

Daisy did not express many issues with finding balance between her home and work life. She and her husband were both working from home and at times this created tension when they needed to be on *Zoom* calls at the same time. Daisy alleviated some of this tension by creating a workspace for herself in their basement. In the first few weeks she shared it was hard to keep the balance with the housework and cooking, but eventually found her flow. She said, “I’m realizing that I’m not just a teacher from 8:00am to 3:00pm. I’m really a teacher all day and all night because my kids are sending me messages at 12:30 in the morning.” (I2) She quickly explained she wasn’t responding at those hours, saying,

I told the kids that if they need me, I’m available until 10 o’clock at night. I will respond, but after 10 I won’t respond until the next day because I go to bed. I don’t want one kid to not be able to get an answer from me when the only time they have access to the internet is when their parents are home. (I2)

Daisy was intentional about time on the weekends and saved time for family and time for herself to recharge. Daisy shared in week three that “after our emergency staff meeting and after my third meeting on *Zoom*, I had to turn off the computer and walk away. I used that time to paint my son’s room and found painting to be a good stress relief.”

Daisy also struggled with feeling as if she wasn’t teaching and wondering if she was doing enough.

I don't feel like I'm doing enough to get paid. And I don't like that feeling. You know what I mean? Because I'm not doing anything, I mean, I want to keep getting paid. Don't get me wrong.” (I1)

I’m not sure any of this is really worth it. (I7)

It was almost like they were saying *just keep them busy*. It was almost like saying, *you're going to be a babysitter here but you're still going to get your full pay*, which I feel guilty about, but I'm not going to complain about that. (I9)

She became frustrated when she would see posts shared on social media by other teachers that would lead to a comparison of what she was doing:

I've seen all the other stuff that other teachers are doing, not necessarily in our district, but I'm like, *holy mackerel!* I mean, what's going to be our expectations because I know, not all of our kids are going to be able to be on a laptop. I mean, some of them might have to wait until their parents come home to even be able to be on the phone. (I1)

I see on the teacher AMI Facebook page, I mean, some people are just killing it! I'm just like, *how do you have the participation?* You know, some teachers are able to assign all of this stuff. They're like teaching over the computer. I'm sitting here like, *please say hello to me*. So yeah, I don't know. I don't think I'm alone. I'm not saying I'm ready to quit by any means. I guess I'll be putting on a clown wig and a nose or something to try to get the kids to participate more. (I6)

Frustration continued throughout the experience when she did not think her students were motivated or did not have 'grit' as she called it:

Sometimes these kids have got to have some grit. And they don't right now. I mean, they're like, *Oh, I did not wake up in time*. I'm like, *my zoom call is at 11:30. Set your alarm. What if you were having to go to school?* (I2)

Unless they are go-getters, unless they have the grit to begin with, I think remote learning equals early summer vacation to them. (I6)

Remote learning is just difficult for children this age. They don't have the grit that they need. They don't have that gumption yet, that drive to learn that they need to be successful in a full online situation. They don't put forth a lot of effort. (I9)

The ones that have the grit, they would go above and beyond, doing more than I asked each week. The other kids, they're the ones that will be struggling when we get back to the classroom. (I9)

Daisy's Reflections on the Remote Learning Experience

The remote learning experience provided new perspectives about her teaching practices and utilization of technology in the classroom. Her self-reflection started early in the experience and continued throughout the remote learning period.

I'm learning something about my teaching style in the classroom. I do way too much helping. I'm finding that when they have to be self-sufficient or do it on their own, they are not doing it. I do way too much helping. (I3)

I know that next year, whenever I'm in the classroom, there's going to be a lot more *Google Classroom* stuff going on. We're going to be checking emails on a regular basis. We're going to be doing a lot of things differently. Because I think this became so easy for schools to do, that if we have another crisis next year, which it's predicted this is going to happen again, we need to have a system in place prior to this ever happening. So, you know, there's going to be a lot less of Mrs. Grayson doing stuff and a lot more of them doing it. (I7)

Do you have like an hour and a couch? (laughing) Because I've learned I'm a rescuer. I don't wait long enough for them to answer. I need to start setting timers for myself. Or I need to put a rubber band on my wrist and pop myself whenever I'm going to try to save them. I don't know if I'm a saver because of our school population. It has been ingrained in my mind: *these poor little kids*. But I don't know why I have turned into a rescue boat. I just drive my boat right up, give them a few minutes, and then I just save them. That was an eye-opening experience for me through this whole thing. And I've shared that with you before, that I tried to save them too fast instead of making them struggle. And I don't know why I do that. I don't know if it is because I struggled whenever I was a kid. I don't know that. (I9)

I don't have as much patience as I thought. I feel like that's probably why I would jump in. And that awkward silence is awful for me, I cannot stand to have silence. I mean, even when I'm washing dishes, I have to have something going. I cannot stand to have the silence. And I think that's why I saved them so fast is because they get quiet. (I9)

One of the highlights of the experience was being able to see the kids on *Zoom* and watch their personalities come through in those meetings. She appreciated seeing a new side of them and their unexpected actions each day.

They were a little bit different on zoom calls than they were in the classroom. The boys would come to zoom without shirts on, and I'd say, *go get dressed, you would not show*

up to school without a shirt on, you know, things like that. But I thought, wow, I did not expect that from that kid. I saw different sides of my kids and I really saw some things, some positive things that came out of it too. (I9)

She loved the excitement they displayed with activities they would not have done in the classroom and enjoyed seeing them in their home environments. She also appreciated that they still loved a good read-aloud, claiming, “those that kept coming back to our *Zoom* calls were excited about the reading. I probably could have kept some on all day if I were reading.” (I9)

Even though seeing the kids on the *Zoom* calls was a highlight of the experience, participation in the *Zoom* meetings was also one of her obstacles in the experience. She struggled with getting the kids to turn on the camera, chat, and participate in the conversations on a regular basis. She taught them the protocols and participation techniques early on, but struggled with their lack of participation saying, “you know, they would show up, but they wouldn't turn their video on, and they wouldn't chat. They were just like a lump on a log.” (I9) She also did not like the feeling of “chasing kids down to get their work turned in.” (I9) She did not understand why she had to search for them and chase them down during this learning time.

This is a dedicated school time. I understand if you don't spend a whole six hours doing school because seriously, you don't need to spend six hours. But you know, I have reworked all my schedule. I was available every day. If the parents thought schoolwork was important, they should have been doing something or pushing their kids to do it. It should not have been a *well, if you want to honey*, it should have been, *this is your school time, you'll do it*. I shouldn't be chasing kids down to do their work each week. (I9)

Another obstacle Daisy discussed was the lack of guidance and clear expectations from the district. The information they received was constantly changing and what they heard from their principal as the emphasis or importance was not necessarily the same thing other schools in the district heard from their principal. The one guideline that was made clear to them from the

beginning was that they could not introduce any new learning and engagement with students was the most important aspect. Daisy struggled to understand how this was acceptable.

I can't teach them anything new. That was silly. I can understand that some kids aren't all connected to the internet. But you know what? Those kids that were, I should have been teaching them. I think because of how it was portrayed, that the engagement piece was what the only thing that was going to happen, I feel like the parents saw that as an option: *sounds like you're just going to review so you can join if you want to.* (I9)

It's not like there's any accountability. We have been told that for the fourth quarter, as long as they are engaging with us and they are participating, their scores will stay the same. Whatever they had for the third quarter they will get for the fourth quarter. If they don't engage, and they don't participate in zoom calls at all through the week, then on a case by case basis we can drop their grade. (I3)

Even though engagement with the students was expected during the experience, they did not receive guidance as to the frequency and duration of engagement and there was no definition or criteria of what constituted engagement. Each teacher or school was left to determine that on their own.

Daisy felt somewhat prepared for administering instruction during remote learning. "I did the best I could with what I knew how to do." (I9) It was difficult to know exactly what they were or were not supposed to do without expectations from the district.

I feel like if I would have had better expectations, I probably would have stepped up more. But I did not want to overstep my boundaries. What or where's the stopping point here? And, you know, I wanted to do the best for my kids that I could do. But I did not want to do what I wasn't told. I mean, there was a fine line and I'm like, I want them to learn. But at the same time, I don't want to do something I'm not supposed to do. So, we really, I retaught stuff that we had already learned. I did not bring any new stuff technically into the picture. I mean, we'd already done a lot of the stuff.

I did the best I could, given what I knew I could do. Could I have done more? I am sure I could have. But not until the expectations are clear, until I know exactly what the expectations would be. (I9)

She did not feel prepared to engage students in videoconferences, but she quickly learned how to use *Zoom* effectively.

One thing that I was not prepared with was the whole *Zoom* thing. I had never done *Zoom* before but now I feel like I'm an old hat at it. I did not know what I would need to know when we started this process, but I guess I feel like I'm in a good place right now. (I9)

While she felt a sense of preparedness, there were a lot of ways the experience could have been improved. She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Establish expectations from a district-wide perspective. Give teachers boundaries and have specifics laid out so that everyone is on the same page.
- Set accountability measures and expectations.
- Provide technology training for teachers with the platforms and programs they should be expected to use.
- Prepare students in the classroom with the expectations for learning and the expectations for participation online.
- Teach students how to use the programs and turn in their work.
- Teach digital etiquette and online social skills.
- Provide time-management training to students to support them in setting up routines and schedules at home.
- Ensure parents understand the importance of online learning and the expectations for students in these situations.
- Provide training for parents on how to support their child in at-home learning situations.
- Develop consistent methods of communication for parents, students, and all district staff.

Daisy shared that her district had already announced they would be using *Google Classroom* as a district-wide platform beginning in the fall. She expressed intentions to provide student expectations for technology use starting at the beginning of the school year, saying,

We will go over the expectations with technology. Here's what I expect and how I expect work to be turned in in a timely manner. I'm going to show them how to check and use their email. I just assumed they knew how to do this, and I was wrong. (I9)

As she reflected on the spring remote learning experience, she expressed concerns about what she and other teachers would be seeing when they return to school in the fall.

I think it's going to be a struggle whenever we go back to school. If we go back to school in August, I think that kids are going to be really excited to be back at school. I don't doubt that one bit. But I think we're going to see some issues. They're learning will have gaps. They're behind. Not that we had, you know, eight weeks without learning anything new. But I also think we're going to have some lethargic children. I think we're going to have children that don't feel like they have to do it because they had a whole quarter where it did not matter if they don't do it. I really feel like that is how some of these kids have seen this. They've seen this as 'I started summer vacation in March.' (I9)

While she was concerned with gaps in student learning, she was also concerned about addressing those next year during implementation of a new mathematics curriculum, too.

We're getting a new mathematics program, and I'm thinking we're in trouble. Because I think we're going to have a big shift in what kids know, and what they're coming in with and where we're going to be sitting next year. And, you know, I would know how to fix some of that normally. But with the new curriculum, I don't know. I don't know what this is going to look like. And that's one of my concerns right now about starting a brand-new curriculum. (I6)

Many of these concerns led Daisy to have conflicting thoughts about the effectiveness of the remote learning experience too. She thought for those students who were self-starters and already motivated to do their work, the experience was probably effective. On the other hand, Daisy did not think it was effective for most of her students. "If they were not motivated and did not want to participate, it's not beneficial." (I6) Daisy shared, "I think some kids can do remote learning because they're geared to that self-paced environment. But so many kids need that social aspect, that peer push. I think that helps." (I6)

Daisy appreciated the reflection time and said,

It was a hard job, and we did not get a guide manual to do it, you know, *when there is no school, go to chapter twelve*. I think the only thing we can do is reflect and figure out how we can do it better next time. (I9)

Transition Back to School in Fall 2020

Daisy's district returned to school, both on-site and virtually, on August 24, 2020. Parents had the option to choose whether their student would return to school onsite or participate in virtual learning. They were asked to submit their choice and stay with this option for at least a quarter, even though some have been allowed to shift. Daisy is still teaching 5th grade, with 23 students. She is at the same school but has a new principal this year.

Due to COVID safety restrictions, they have a lot of procedures and strict time schedules they must follow. Daisy expressed frustration with the new schedule and her additional duty time this year. "The kids come into the building at 7:15 and I'm not even supposed to be there until 7:30 but I'm coming in early because the kids are in my room." (I10) She elaborated on her duty time saying,

I added up my duty minutes. I have 235 duty minutes a week and 180 of those are recess. The rest are after school duty. I have a duty every day but Wednesday. And I'm worn out. So, the only time that I'm not with those kids is during one recess a week and during specials each day. But for lunch, we're in my classroom. So, I can't work in my classroom during lunch, like I used to. (I10)

They have restructured their classrooms and the desks are all in rows distanced apart. The space in her room is limited and she joked saying, "if I get any more students, they're going to have to be outside the window. I have no more space. I don't know what else to do." (I10) They are not able to have group work, and the students in the back have difficulty seeing her SMART board in the front of the room. While she is struggling with many of these restrictions, the students are doing well considering the circumstances. "In all reality, they've come back, and they were ready to go. I mean, they missed being with people, and they like to go to recess and be able to take off their masks." (I10)

They have worked hard to prepare the students in case they have to switch gears and quarantine. Daisy said, “we keep hearing we have to be ready to pivot.” (I10) They started using *Google Classroom* day one and are using their Chromebooks several times a day. Daisy expressed frustration with the limitations of access to Wi-Fi at their building, stating, “so many people are online, we are always getting disconnected. The kids’ laptops are always disconnecting or always trying to connect or something because we don't have enough Wi Fi access points.” (I10) Even with the internet struggles, Daisy believes they would be ready to pivot if needed.

I believe they're ready to pivot if we have to. I mean, I don't think school is going to get canceled. I just think that kids are going to be sent home to quarantine. I think that the kids grasp it. I mean, it seems like everyone's doing a really good job at keeping things clean and doing their best. So maybe that's going to keep us at school so that we don't have to pivot. (I10)

Daisy expressed frustration with several other struggles during the transition back to school. It’s been difficult working with all these restrictions and changes to their classroom and curriculum while also learning the ways of a new principal. Daisy said the new principal “is making decisions without any input from them or before finding out how they might have done things in the past.” (I10) While she understands she is new and setting her own path with the school, it has been frustrating to deal with these changes on top of everything else they are doing.

Another struggle is with the new mathematics and literacy curricular resources they began implementing this fall. Teachers received some virtual professional development in May 2020 and over summer break for their new mathematics program, but it was difficult to start the program knowing students had missed an entire quarter during the spring remote learning period. “The new mathematics program stinks. The kids can’t do it. It’s so hard that I’m doing it all with

them.” (I10) She explained that the kids struggled with the first concept presented and said, “I know they did not get to measurement like this in fourth grade at the end of the year, so they are struggling with volume.” (I10) She explained that the district provided them with a ‘gaps document’ that indicated any instructional gaps in mathematics due to remote learning in the fourth quarter for each of the grade levels. “Our sheet said that our kids coming into fifth grade, that there were no gaps. They were taught everything they needed to learn in mathematics before remote learning.” (I10) Daisy laughed and scoffed, saying, “I know this isn’t right. We just struggled with volume. How can you go nine weeks, only reviewing, and say, *there are no gaps?*” (I10) She also expressed frustration with a new component in their literacy program that is delivered digitally each day. Daisy shared, “it feels stupid to have a recorded teacher teaching my students and not me.” (I10) She doesn’t feel she is teaching and expressed sympathy for her full-time intern who isn’t getting an opportunity to plan her own lessons.

The mathematics curriculum is scripted. The literacy is scripted. I’m not sure why I’m getting paid the big bucks. Everything is planned for me. It’s difficult for my intern to come up with her own lesson plans because everything is already scripted. I mean, I get to have fun with social studies and science at least! (I10)

Daisy also shared about their struggles in preparing progress reports for parent conferences and that there was school-wide confusion as to how they were conducting the conferences and the duration of the conferences. Daisy vented about these frustrations:

Things have boiled over and I was absolutely at my breaking point. It's just that no one knows what the heck they're doing. Then yesterday, lo and behold, out of the blue, we got a brand spanking new progress report. It doesn't look anything like the progress report we've had, and it is not translated. So, we can't even start on it until we get that translated one. It's just like, it's like people are expecting a lot out of us. And I know that everyone's saying you're going to have grace, but I don't feel like I have grace. I don't feel like they are giving me grace. I don't know. It's rough. (I10)

Daisy's Perceptions of Future Implications from this Experience

Daisy is already seeing implications from the experience on their instruction and back-to-school experiences this year. She understands why they are integrating all the technology, but she is also seeing the negative side effects. They have spent a lot of time teaching students how to use the technology and said the only paper her students touch are their mathematics workbooks and literacy workbooks. She said her students are getting tired of the technology and she shared this story:

We're on the Chromebooks several times throughout the day. And one of the kids said, *can't I just have a real book? Can't I just have a real book? I don't want to do Get Epic anymore.* We haven't gotten library books yet. I mean, it was like the second week of school and he's like, *I just want to book in my hand.* And it was like, wow, have we not come full circle? They're tired of technology. So, you know, there's some pluses and some minuses to that, too. (I10)

Beyond the technology implementation, Daisy believes the remote learning experience in the spring has “put a dent in our education. So many kids are behind now.” She went on to share that her literacy assessment scores are the “worst I’ve ever seen, in all the years I’ve been teaching. It’s very sad having so many in the ‘two-grade-levels below’ category. That’s very scary to me.” (I10) She doesn’t know what the long-term implications will be, but she did not want to go back to a remote learning situation. “It’s not for everyone. Will remote learning change? I don’t know. I just know I don’t ever want to do it again.” (I10)

10. Elizabeth's Story of Pandemic Induced Remote Learning

Background and Context

During the remote learning experience of Spring 2020, Elizabeth was teaching fifth grade in a small district in a rural area of Arkansas. Her intermediate school serves fourth through fifth grade with an enrollment of 730 students and 58% free or reduced lunch eligibility. She was in her 17th year of teaching. There were three teams of fifth grade teachers in her building, with each team departmentalizing instruction in reading and social studies, writing, science, and mathematics. The fifth-grade students were divided into three teams and each assigned a homeroom teacher. Students received their subject area instruction from four different teachers and rotated through hour-long instructional sessions with each teacher. Her team served 105 students and she provided the writing instruction.

Her district had approved Alternate Methods of Instruction (AMI) protocols in place prior to the possibility of school closure in March. They already had five days of work prepared for students in the event of inclement weather or natural disasters that would shut down school for a temporary period. When the threat of statewide closure was known, the teachers worked together and gathered work for an additional five days, giving them 10 days of AMI prepared work. These paper packets were sent home with students on Thursday, March 12th and remote learning procedures began on March 16, 2020. Students completed these packets during the first ten days of remote learning and then shifted to online platforms for delivery for the remainder of the remote learning experience. Due to inequitable internet access throughout their community, they also created paper packets that parents were able to pick-up for their students. If online instruction was chosen, students were able to check out Chromebooks from the school for the experience. Elizabeth's team had about 90 students with instruction online and about 15 students

completing paper packets. This number fluctuated during the experience due to limited internet access and some specific student needs.

Science Instruction in Remote Learning Compared to Science Classroom Instruction

Science instruction during remote learning was planned by the other fifth grade science teachers, as Elizabeth's teammate, who taught science for their group, was ill throughout most of the remote learning period and did not have adequate internet access to provide for the students online. Because of this, Elizabeth received the assignments from the science content team and then posted them in their team's *Google Classroom* for the students each week. The science instruction during remote learning consisted of daily assignments from the student workbooks that were part of their district purchased science curriculum. Students would read a passage from their science textbook or workbook and then answer questions related to these readings. If students did not have their workbooks at home, they used a PDF of the assigned pages in the workbook delivered through *Google Classroom* and answered the questions in a google document that they submitted to their teacher. None of these assignments were graded and the third quarter grades were carried over to the fourth quarter. Elizabeth shared this regarding the experience:

Most of the time I posted her lessons because she was not able to do it. And so, I would get the lesson from one of the other science people and I would upload it. It kind of made me want to be the science teacher at that moment because I'm sitting there grading these giant writing projects and she wasn't having to do anything except tell them what pages to read. In this sense, their work was the least interactive out of all the subjects for our kids. (18)

Elizabeth explained this was not like their classroom instruction in science. She shared that the science teacher was "very hands-on in the classroom." (18) They engaged in a lot of experiments

and investigations throughout the year, with very little ‘sit and get’. Their classes were an hour long and they had four rotations of students each day.

Elizabeth’s ill teammate was able to return to school when they began onsite instruction at the start of the new school year in August 2020. While the safety restrictions for onsite learning still prevent certain activities, they have found ways to do several hands-on learning and activities. Elizabeth talked with the science teacher to find out more about her experiences this year and relayed those through our interview process. They use the district purchased science textbook and workbook by Houghton Mifflin Hill and a variety of online learning resources such as *Generation Genius*, *Explore Learning Gizmos*, *Mystery Science*, and *Flocabulary*. Digital learning options are delivered through *Seesaw* and *Google Classroom*. She has four rotations of science, each 60 minutes long. As part of the district’s onsite and virtual learning options, each teacher teaches three rotations onsite and one rotation that is delivered virtually. The school purchased supplies for virtual students to use at home for science activities.

This year, students have engaged in a variety of hands-on experiences that have explored ideas in engineering and investigated matter and its interactions. Engineering design activities include a paper airplane launch, tower power, and a parachute drop. Students have engaged in experiments with matter and have observed physical and chemical changes through a lemon wedge challenge, making s’mores, and in the creation of an electric pickle.

Science instruction in the classroom is much less computer-based than the instruction in the other subject areas right now, being more interactive and hands-on, which is more engaging for the students. The virtual students do the experiment and video their work through *Seesaw*, which is a new platform for their school this year. *Seesaw* works well in the science classroom

because they can interact through video, complete or watch the experiments via video, do any of the necessary reading or research, and then come back and meet with the teacher during their virtual learning time. Elizabeth said, “the students really enjoy the active instruction in science. They’re tired of the computers and get to move around and interact more in her class.” (I10)

The Remote Learning Experience and Influencing Factors

Instructional Delivery Methods during Remote Learning

Being an AMI approved school meant that they already had five days of work prepared in the case of school closure. With the imminent possibility that schools would close due to COVID-19, their principal requested they add another five days of work to their packets and send them home with students on Thursday, March 12th. School closure was announced that weekend with remote learning plans to start on Monday, March 16. The first ten days were completed using paper packets that included daily activities for literacy, science, and mathematics, with social studies being integrated in literacy. Literacy and science activities were presented using a choice board that had nine squares, each containing a different task related to their current topics of study. Students got to pick their task each day and could repeat a task for the tenth day. In mathematics, students had a word problem each day to solve and then completed a set of practice activities from their mathematics workbook. If a student was receiving any accommodations or special services, they received a differentiated packet of work.

After the initial ten days, learning shifted to an online delivery through *Google Classroom*. Elizabeth’s team used the first two weeks of remote learning with the paper packets to practice delivering instruction through *Google Classroom* where they gave students the option of completing their work delivered online or that provided in the packets. The work from the

packets was uploaded into *Google Classroom* and students submitted their work there. They used *Google Classroom* as their delivery platform since several of the teachers had already been using this in their classrooms. They set up new classrooms, one for each of their homerooms, with each of the teachers having access to each homeroom's classroom. They organized their assignment posts by day with their topics so students would automatically see what they were to be doing each day. Beginning in Week Three, most of the students were using the online delivery method. The few students who were completing work through paper packets could pick those up from the school. They worked hard to align the assignments but that wasn't always possible as Elizabeth explained:

Trying to make the assignments online and packets be the exact same is difficult because we can't do our online digital programs with those getting packets." (I2)

We have the online work and the paper packets, but we want them to be equitable. So, we're working through that. The hardest part is making sure that those that aren't online have copies of the books, because if they don't have copies of the books, they can't do the assignments. So, for those that are online, we'll just read it aloud with a digital copy that we present the screen so they can follow along. (I3)

Communication with Parents: Issues and Opportunities

Elizabeth used *Class Dojo*, a class community messaging application, to communicate with her parents during the remote learning period. Elizabeth shared, "I've been very involved on *Class Dojo* all year. I was always connecting to the parents through class dojo. At that point, that was really the only resource for communication." She communicated with parents frequently each week, sharing communication from the district, resources for parents, information about food services, and tutorials for helping the students at home with email and *Google Classroom*. She had three parents she was unable to reach because of lack of internet or cell service.

The first two weeks of the remote learning period, Elizabeth was overwhelmed with the communication with parents.

I felt like I was answering questions from the time I got up to the time I went to bed. There was one night I was answering messages at 11:30pm that night; I just happened to still be awake. In the beginning, it was very overwhelming. It was like I was constantly answering messages. (I2)

Parents are stressed by it. We're trying to make it as easy as we can. But you can tell. I mean, they're sending emails, sometimes about things that have already been answered. (I2)

By Week Four, the number of questions coming from parents had decreased as they started to become more familiar with the online learning routines.

Elizabeth was very cognizant of the pressure and stress that parents were feeling during the experience. She was going through this experience as a teacher and a mom of a first grader, and she felt great empathy for the parents who were trying to work and help their kids at home. She was the only one on her team with a child at home during this experience and she often felt her coworkers were “missing some of the reality of this situation; they’re missing the reality of what parents are dealing with trying to manage work and manage children at home.” (I1; I3)

Elizabeth shared several thoughts regarding the reality of the situation:

I’m trying to be mindful of the parents’ struggle during this time. (I1)

Just trying to keep in mind we do have a lot of parents that are working. We have a lot of kids that are sharing devices. (I1)

I have a mom’s perspective with my own child being home right now. I think this gives me a bit of an advantage over somebody else that doesn’t have a school aged child. (I1)

I made a video for the parents to walk through *Google Classroom*. I was able to go into *Google Classroom* as a student and show them using [son’s] account. It looks different when I’m logged in as a teacher. So, I think that has been helpful than being able to see the student view. (I2)

I think everybody realizes families are in way different situations right now than if we would normally be doing this kind of thing. And so of course, I don't know why else you would do this kind of thing all the time. But you know, that's the biggest thing. We have to be flexible for our families. (I2)

I've got one student with five kids in his family. They're running a farm. He hadn't done a whole lot, but there's five kids in the family and they're sharing a device. Mom's super busy between them and they just opened a farm to the public. And I mean, that's just one example. (I3)

Elizabeth maintained a consistent presence with parents, sharing daily messages, updates, and resources they could use. In Weeks Five and Six, she sent messages to the parents about student progress and how they could check their child's progress from *Google Classroom*.

Unfortunately, many of the parents seemed apathetic at this point, and even tired of dealing with the experience. Elizabeth said, "I feel like parents are probably getting to that point. They're just tired of fighting it; they're over it. I don't know that it would do me a whole lot of good to send messages and say, *I'm not getting work from your kid*. (I5) Overall, the parents responded to Elizabeth and appreciated her efforts according to the comments she received from parents.

Student Engagement and Participation during Remote Learning

It was difficult to determine the degree of student engagement in the first couple of weeks of the remote learning experience, since most of her students were working with paper packets at home. As they transitioned into online learning, they were able to monitor engagement and submission of work through *Google Classroom*. She used a daily check in and check out form to keep up with students each day, having them respond to a question or give their thoughts about a topic. She loved the aspect of using *Google Classroom* with her writing assignments because it made giving feedback easier. She established set hours that she would be online giving feedback to the students. If they had their work submitted during that time, she would read and review then. If they couldn't submit their work until later, she would read and review it the next day.

She explained her reasoning for this decision, stating, “I was constantly giving feedback. I felt like I sat at my computer all day long, way more than I would have done at school. So, I've changed that to where I have set times for giving feedback.” (I3) She enjoyed being able to review and grade their work online and plans to utilize this aspect of *Google Classroom* when they return onsite.

Elizabeth recognized that her students were also dealing with stressful situations at home and tried to remember this as she established expectations for their work. She was flexible with when students submitted their work, knowing some may need to wait until later when parents could help them.

I've tried to be understanding of their situations. And knowing that if you're not turning in work till this time, it's because that's when you can do it. That's fine. I'm okay with that. I'll give you the feedback tomorrow. And then when you can look at it later that day, then you look at it. So, I've tried to be understanding of their situation. I feel like that helps them to be more understanding of mine. (I3)

While she kept an open mind about their work hours, she struggled knowing that the quality of work being submitted was not always up to par with what they were doing in the classroom.

Some of them are picking and choosing. Like if they really like mathematics and science, they're doing mathematics and science, and they're not doing reading and writing. And so we're trying to tell them, especially if it's when you struggle when that's when you need to do the most, because the more practice you do, that's how you're going to grow. (I3)

They just want me to spoon feed it and tell it to them. That's something I think we've kind of realized we've done a lot of is spoon feeding. We haven't trained them in the classroom in a way that they could kind of think for themselves. My fifth graders should be able to do that. I'm just not making them. So, I think we're all learning things that we will do differently. (I6)

I wouldn't say it was the same quality of work that we would have gotten at school. Either that or it was way above the quality that kid would have done. So, we know it was done with a lot of assistance. (I5)

There are a few that you couldn't get work out of at school that suddenly are geniuses, which I feel like it's mom or dad or somebody else doing the work for them. (I6)

Elizabeth's team had Google meets throughout the remote learning period that all their students could join, and Elizabeth hosted a couple of meetings during the initial weeks of remote learning to explain procedures or share information about instructional changes. She struggled with the privacy and security issues within the videoconferencing platforms and decided she'd rather be safe than sorry, so she opted not to host live video meetings for the remainder of remote learning. Instead, she learned how to record herself reading a book and using screen recording tools to support her with short instructional videos that she uploaded in some of the daily lessons. Elizabeth stayed in touch with her students through the student email accounts that were established during Week One of remote learning. She had several students correspond with her throughout the experience and she enjoyed this connection with them. In week three, several of the students shared with her that they were missing school and tired of being at home.

Most of them have come to the realization they miss school, even if they did not like school to start with. They really do miss it. They're bored. They're tired of being stuck at home. They miss their friends. So even if it's not that they miss school because of the work, they're missing their friends and they miss their teachers. They want to go back. You know, they're all hoping in August we get to go back they're all worried we might not. (I3)

Administrative Expectations and Support Provided during Remote Learning

Elizabeth felt supported in many ways throughout the experience. Her principal gave them guidelines to follow but trusted the teachers to know what was best for their students. He was very responsive to their questions and asked for their input with decisions and did not micromanage them. Elizabeth expressed appreciation for that level of trust and support.

Elizabeth worked with two teams on a regular basis: her ‘quad’ team – the four teachers in the departmentalized rotations sharing students, and her content team – the fifth-grade teachers that taught writing. Both teams provided support and encouragement throughout the experience. Her quad team had some disagreements at the beginning of the experience regarding how they wanted to do things. Several of them wanted to do everything the same, but they were able to talk through the concerns and they compromised, allowing each of them to do what they felt was best for their needs. Her content team worked well together and provided a safe place for them to bounce ideas off each other and transition together, as Elizabeth shared, “we already had the PLC process in place. So, we’re very used to already working together as a content team. So, it’s really just moving from being in a classroom to being virtually.” In several of our interviews she talked about both teams’ support and collaboration and that she never felt like she was going through this alone. “I feel like we’ve had some really good collaboration. I did not feel like I was alone in any of it. And so that was helpful.” (I2; I5)

From a district level, her superintendent provided guidance and leadership and gave them insight for the flexibility they would need in the experience. Their district curriculum facilitator attended all their content team meetings and was extremely helpful in finding resources for them to use during the experience. The district kept teachers updated with reports and decisions from the state level and provided several resources for teachers to share with their parents. The district provided guidelines for their fourth quarter grading based on recommendations from the state department of education. Students’ grades from the third quarter would carry over for the fourth quarter. If a student showed growth or improvement during remote learning, they could increase their scores, but they were not allowed to decrease scores or penalize students during remote learning. Elizabeth shared her thoughts regarding this decision:

Third quarter grades carry over. And then if a student really shows that they need to go up we can do that, but we can't take any down, we can't make it a negative impact on them. I think some kids are figuring that out. We can try to require them to do it. But there's not really any recourse if they don't. And I think some know that. If this were something I was doing full time, there would definitely need to be some recourse if they did not do it. As opposed to right now, there's not a lot I can do if they don't do it. I mean, I put their name on the list and have the counselor contact them. But then you know, from there, what do we do? Are we going to be able to keep them engaged and coming back and doing it until that last day? (I3)

Elizabeth found that many of her students and parents realized that grades would not be negatively impacted, causing them to view this as “an optional experience” like they were on an extended spring break (I6). While Elizabeth did not necessarily like the grading decision, she was glad they use a standards-based grading system, noting,

We knew what standards would show up on the report card in fourth quarter, so it was easier to carry that over, looking at it by standard, rather than if it were traditional grading. We knew what we needed to focus on. I do think that's a benefit there. (I5)

Issues and Personal Learning Experiences with Technology

They transitioned to online delivery methods in Week Three of remote learning. Her team opted to use *Google Classroom* as their delivery platform since some of the teachers had been using it previously. In week one, Elizabeth began working to create the online learning environment for students so they could practice using it and work the kinks out before officially starting in Week Three. She explained,

I did go ahead and start trying to set some things up in *Google Classroom* because I wanted the kids to get used to that just in case it stretched longer. That was very overwhelming in the beginning because even though we use *Google Classroom* at school, they weren't prepared for that with the AMI packets. (I1)

In Week Two, she was grateful she started practicing with students, saying, “we've used it all year, but it was like they forgot half of what we were supposed to do.” When they transitioned in week three, she created several videos to walk students and parents through using *Google*

Classroom for the online learning. When students or parents asked questions regarding their online learning process, she referred them back to these videos to help them find their assignments and know what to do. While Elizabeth had used *Google Classroom* in her classroom, she learned how to use it more effectively during the experience, stating, “there were a lot of features I did not take advantage of before.” (I6)

Elizabeth often shared she considered herself to be a “pretty technical or technology savvy person” but she also acknowledged that she learned a lot more through this experience. In week one she shared, “I normally do pretty well with technology, but this has stretched me. It’s learning a lot of new stuff really fast and then trying to help other people learn it at the same time.” She often found herself using her son’s account to see it from a parent perspective so she could walk her parents through the process, saying, “hey, this is what worked for me or this is what I did for my child.” (I1) She joined several online communities and social media platforms to learn technology tricks of the trade, some of which included learning how to use *Loom*, a web-based screen recording platform, learning to use *Google Forms*, learning how to use extensions in Chromebook, and learning how to make a *Google Classroom* header. “I’m learning a lot. I feel like I’m going to be a better teacher next year because of this experience.” (I4) In Week Six, she shared, “there are already things I know I’m going to teach and use from here on out because of using it in this situation. We’re all learning things will do differently.”

There were some challenges associated with using technology during the experience. Elizabeth’s teammates were not as comfortable with the technology and struggled through the experience. “Some of this virtual stuff is a lot harder for some of my teammates than me. They’re more experienced teachers but the technology, it’s a little more of a struggle.” (I1) Because of this struggle, Elizabeth often found she was fielding most of the questions from their parents

during the first few weeks, which was frustrating. The experience offered all of them a chance to learn and grow, which Elizabeth saw evidence of in Week Four:

I think we all have become more proficient with the Google platform. So, I see that being something we will use more collectively next year. And I think that's going to help if we end up in another situation like this; it will be something more consistent that the kids have used.

Another challenge throughout the experience was access to and the unreliability of the Internet where they lived. Even with mobile hotspots that were available, many students still were not able to access the Internet. They also had difficulties with power outages during several storms that occurred during the experience. Storms hit their area at least three different times during the remote learning and caused multiple days of power outages.

We've definitely learned technology is hard enough, but with a lot of rural students, a storm, especially this time of year can make it very difficult. They're still taking several days to get it back for those students out in the rural parts that already struggled with internet anyway. Now, it's just really bad. We did try to reach out and at least put messages on *Class Dojo* like, *hey, how are you doing? Just checking in*. We just wanted to make sure everybody's okay and handled the storm. This has been a learning curve and has definitely displayed the lack of equitable access to the Internet in our community. (I3).

Other Factors Influencing the Remote Learning Experience

Finding a balance between being a teacher from home and being a mom with a first grader in the house was often a struggle for Elizabeth. Both she and her husband are teachers, and both were trying to keep up with the demands of their roles as teachers while also trying to help their son keep up with his remote learning. While the experience of having a school-aged child at home during remote learning offered some advantages, it also brought different pressures. While being a working mom is normal, it's a different experience to be working at home, with a child at home who needs attention and monitoring. Elizabeth shared,

But it's different. Yes, it's different. When we're at school, he goes to his class and his teacher teaches him. And I'm in my class, and we're separate at the time. But now, he's not with his friends. So, he's lonely. He wants more attention. I can't give it to him because I'm having to teach class. And so that that was hard. (I9)

Elizabeth also had to facilitate therapy appointments for him throughout the experience. The remote learning situation offered Elizabeth a bit more flexibility in scheduling these appointments. She was thankful that her son is a good student and was able to handle the experience at home. She did not feel he was “necessarily missing anything educationally” due to the experience. (I9) Elizabeth believed this experience helped her better understand the plight of her students’ families and gave her greater empathy for the parents.

Elizabeth often spoke about her concerns with equity during the process. There were obvious struggles with equitable access to the Internet in their community. Due to lack of internet, some students had to pick up paper packets to complete their remote learning assignments. While they tried to align the packet work and online assignments, equitable instruction did not occur.

The kids working with paper packets weren't getting any of the instruction. Whereas the kids doing it online were, or at least they're getting access to videos and *Google Meets*. The ones doing the packets, they got none of that. And a lot of the kids that were doing the packets were the kids that needed the instruction more than any of the other ones. (I9)

It was also difficult to know that the students who really needed the academic support from teachers or parents were usually the ones not receiving it. They were the ones who typically did not complete their work or submitted work that they knew was completed by someone else. She missed the ability to support her students and provide the instructional assistance and accountability they needed. The kids recognized this was missing from the experience too, and wrote about it in an assignment:

There were several that wrote about how they were missing school. They talked about how when they do their work at home, the teacher is not right there to help them if they're confused. And sometimes, it takes a little bit to get that explanation from the teacher. That's kind of hard to give virtually. (I4)

Elizabeth's Reflections on the Remote Learning Experience

Elizabeth missed the personal interactions she had with her students in the classroom, sharing “I need to see the kids. I need to be around the kids. *Zoom* is not enough. A video chat isn't, I mean, none of that is enough. I need the kids.” (I6) She struggled knowing that she could have been giving them so much more, yet they were instructed to only review concepts and there was no accountability for the work during the experience. While she was not a fan of remote learning, she will teach in whatever manner she's asked, but, she said, “if this were the new norm, I would want to be able to teach new skills and standards and there would need to be some expectations and recourse for doing the work.” (I3: I9)

One of the highlights of the experience for Elizabeth was seeing the way that teachers came together to support one another. Elizabeth found several online communities of teachers that formed to help teachers across the state and across the country get through the experience. She learned about different technology resources, found lesson ideas, and gathered resources to share with her teammates. These communities, along with the support of her teams, helped Elizabeth feel connected, saying, “We came together for it. I did not feel like I was in it alone.” (I9)

Besides managing this situation as a teacher and a parent, her biggest obstacle during the experience was trying to help parents understand using the technology and trying to troubleshoot over email. She created videos to walk parents through the applications and expectations, but she knew they weren't watching those videos when they would send her questions that she had

answered in the videos. This was frustrating and often left her feeling tied to her computer during the first few weeks. This created another obstacle with boundaries for work and home time.

In the beginning it was hard. I mean, I was answering questions at 10 o'clock at night. You never really left work. I did finally get into a rhythm and kind of set some parameters for myself because I felt like I had to. But the computer was always there looking at me; I always felt like there was something that needed to be done. Whereas when I leave school, I can take a break from the classroom. I may come back and work on some things at night, but I don't always, and I can leave it there and come home. (I9)

Elizabeth felt she was prepared to administer instruction during the remote learning experience but not because she had been trained to administer in this manner. She believed she was prepared because she had taken initiative to learn and try new things in her classroom. She is not scared of learning and trying to use new technology and applications. Elizabeth explained how she felt prepared:

Did I feel prepared? Yes. But not because I was trained that way. It was more because that was something that interested me interested me from the beginning. And so, I took the initiative to kind of learn how to use *Google Classroom*. Now there were still things that I had to learn in the process, but it doesn't scare me to learn those things. And so, I was quick to be able to learn them and figure them out. It doesn't scare me to try things. And I think some people, they're afraid they're going to mess something up. I know, some of my teammates were just really scared to get in there and even post lessons because they were afraid they were going to do it wrong. (I9)

She believes it would be beneficial for teachers to have more professional development on different technologies and prepare them for things they could with students, not only in case of another remote learning situation, but also to use in the classroom. She did not feel as prepared when it came to understanding the expectations of what students should be doing and holding them accountable for the work. She offered the following thoughts when asked what could be done in the future to better prepare for a similar situation:

- Provide differentiated levels of technology training for teachers that will offer practical training for using technology at all levels in the classroom.

- Ensure teachers have laptops and appropriate, up-to-date technology to effectively teach at school and from home.
- Establish accountability expectations for learning at home.
- Teach the technology tools in the classroom starting on day one.
- Host parent meetings to demonstrate the technology tools and allow them to experience working with these programs.
- Ensure parents understand the expectations of remote learning and the use of the technology.
- Provide technology and Internet access to those families who don't have it at home.
- Gather feedback from parents about times that would work better for their kids and themselves in at-home learning situations. Know when the best times would be for live meetings or for work completion deadlines.

As she reflected on the spring remote learning experience, she was encouraged by things she'd learned about herself and others in the process. She learned that she's adaptable and open to change. She learned how to utilize *Google Classroom* and other programs for giving feedback digitally and sees the benefits of continuing that process in the classroom, saying "it is much easier to give feedback on their writing digitally." (I9) She was excited about the growth and progress she saw with her teammates, too, stating,

I think we've learned a lot through the process. We've already talked about things that we're going to do in the fall, such as using student email and *Google Classroom*. Now they see where it can be beneficial, even in the classroom, without it just being an at-home thing. With the possibility of going to distance learning, it's something we have to start from day one. So, we have to teach the kids and we have to help them to know what our expectations for it would be and how to use things. (I9)

Elizabeth did not believe the remote learning experience was effective. The kids that did well in class continued to do well in the remote learning, while those students who were struggling in the classroom, continued to struggle at home through remote learning.

I don't feel like it's been as effective as it should be. I think moving forward, if we were to do it again in the future, if we have to, we've got to somehow figure out a way to make it more mandatory and help parents to understand the importance. I get it right now; they're overwhelmed with all kinds of things. I don't know that the kids have learned a whole lot. And the interesting thing, we were talking about this as a writing team, we had more kids doing the work when it was our big writing assignment projects. When it became the easy

stuff, they quit. It kind of intensified what I already knew about them. The kids that were hard workers continued to be hard workers. The kids that were slackers continued to be slackers. I think we would have gotten greater participation if they knew there were consequences for not doing their work. If that had been in place, I think we would have had more success with it. (I9)

Transition Back to School in Fall 2020

Elizabeth's district returned to school on August 24, 2020, offering both onsite and virtual options for students. Parents had the option to choose whether their student would return to school onsite or participate in virtual learning. They were asked to submit their choice and stay with this option for at least a semester, even though some have been allowed to shift. The virtual classes are taught by each of the teachers in Elizabeth's team. They teach three class rotations onsite and one rotation virtually each day. If a student is sent home for quarantine, they are added to the virtual learning option during the quarantine period. The teachers are working diligently to ensure the instruction provided onsite and virtually is aligned and equitable. They have about 25 students attending virtually and about 75 students attending onsite.

The district saw the need for a consistent online learning management system and purchased *Seesaw* for kindergarten through seventh grade to use along with *Google Suite* products. While she appreciates the effort to maintain consistency, she said "it has been a bit more difficult to use because it doesn't do everything we need it do, including differentiated work and comments options." (I10) They are still able to utilize *Google Classroom* and other programs for a variety of purposes. She was frustrated with the roll-out of new program, as they did not provide any training other than a selection of videos to watch.

So rather than providing training, it's been a lot of learning on our own time watching videos. And then I got to do some of the training early, so then I've had to help train some of the other teachers. So, that's taking a lot of time to know what we're doing and how to

do it. And there's still a lot of questions and things like that. They're trying to offer consistency, and the theory behind it is good, it's just been frustrating. (I10)

Seesaw offers an integrated communication tool for parents which is extremely helpful for their virtual students. All but one of the virtual students has a parent connected through *Seesaw*.

The district also purchased *Go Guardian*, a software that helps the teachers manage the student devices and monitor online safety. With this program, they can view the student's screen, remotely access, and control the screens to help students, and pop-in with video chats on student devices. This has greatly improved her ability to support her virtual students when they are struggling.

Elizabeth is glad to be back on campus and is enjoying seeing the kids again. The kids are handling wearing masks better than she anticipated, yet they have found that students are starting to learn they can talk, and the teachers don't know who's talking, so that's led to some fun interactions in class. Classroom instruction looks a little different than before, as they are working with safety restrictions. They are using digital learning options in the classroom and trying to mirror instruction in the onsite and virtual environments. While this helps them remain aligned and in the same place, it also presents challenges. Certain lessons are not as easy to deliver virtually and she struggles to modify them and ensure they get the same kind of instruction. She is concerned her virtual students are getting bored with instruction and letting other things distract them. She also expressed her concerns with the amount of learning that is digital, worried that it is too much time on the computer.

Everything has been in *Seesaw* or *Google Classroom*. It's all been digital, but for a couple of reasons. One, so that we're all streamlined, and all know how to use it if they have to quarantine or if we have to go digital. Two, because we don't have to touch paper. That's a bit of a concern too. (I10)

They did one activity on paper the week of our final interview and she said, “the kids were so excited to use actual paper today.” (I10). While she has concerns about the amount of work they are doing digitally, she understands why they are doing it and sees some benefits too.

More of what I'm doing is digital across all classes because the kids need to know how to do it, and that way it is seamless if we have to go virtual. It's not how I would want to teach all the time, but I do think there's a benefit. I think I would do some of it still, but not as much as what we're doing. There are definitely some benefits to doing some of the digital stuff that can help the kids all the way through life. I mean, I did an online master's program. That's the world these kids live in. And I think anything we do digitally can help them in the future. It just shouldn't be all they're doing. (I10)

Elizabeth's Perceptions of Future Implications from this Experience

When talking about how this experience might impact the future of education, Elizabeth hopes that future virtual learning options will have dedicated virtual learning teachers, not teachers that are trying to teach both onsite and virtually. She sees the virtual learning as an option that will most likely be available moving forward but hopes it does not overshadow the onsite learning options.

She has noticed a greater emphasis on using technology with the students and believes this could be a beneficial tool in providing differentiation through these platforms. She can see using digitally provided instruction to small groups of students while she works with another group onsite or even virtually. “I can see how using *Google Classroom* would make it easier to differentiate assignments because I can assign certain things to certain kids. It was harder to keep up and manage all of that when it was paper.” (I10) She also saw it as an opportunity to reach all students:

What would be nice is if we could get to a point where kids moved a little more at their own pace. So, if they're a kid that's a fast worker, we could go ahead and move them. Sometimes the traditional classroom is very restricting to some kids. I think the hardest

kids to reach sometimes in a classroom are your gifted kids, your higher kids. We spend so much time focusing on our struggling kids. So, this would give us some ways to maybe even reach those kids a little bit more; give them those pushes, help them to move, while we spend time focusing on our struggling kids. (I10)

While she doesn't know what future holds, she said, "I feel like we'll all be better in the end.

We've learned a lot in the last six months."

Chapter 5: Results – Cross-Case Analysis

Introduction

This chapter presents a summary of the data from the individual case studies and compares the results across cases to propose patterns, trends, and commonalities. The results are organized following the related research questions. Data from the individual cases are displayed in tables, profiling each case individually, yet allowing for comparisons in the cross-case analysis of the profiles (Yin, 2014). The first section presents results related to Research Question 1 involving elementary science instruction in the classroom compared to science instruction in the remote learning environment. The second section presents results for Research Question 2 about the experiences of elementary teachers in delivering remote learning, influencing factors in the experience, and their perceptions of how the remote learning experience will influence the future of education. A discussion of the findings and conclusions related to the literature review will follow in Chapter 6.

Results related to Research Question 1

How did elementary science instruction in the remote learning environment during early response to the COVID-19 pandemic compare with normal or traditional classroom science instruction?

Data will be displayed in three tables segmented by grade level with a discussion of each of table, allowing for smaller cross-case analyses of data with subjects in similar grades. Table 2 displays the data from the subjects who taught kindergarten through second grade. Table 3 displays the data from the subjects who taught third and fourth grade. Table 4 displays the data from the subjects who taught fifth grade. After all tables are presented and discussed separately, results will be compared across all cases.

Table 2: Science Instruction Comparisons for Kindergarten thru 2nd Grade Classrooms in the Study

Subject	Grade Level	In the Classroom Prior to Remote Learning	During Remote Learning	In the Classroom After Remote Learning
Anne	K	<ul style="list-style-type: none"> Wasn't emphasized; was an afterthought Literacy and mathematics were the focus Few hands-on activities in curriculum 	<ul style="list-style-type: none"> Paper Packets: cut/paste, sorting activities Online: 1-2 days/week with videos and brief activity Supplemental at-home, hands-on activities: playdough, Oobleck, mixing colors, nature walks, poke pencil thru bag, penny in vinegar and salt Supplemental activities not aligned to weekly topics or grade level standards Concepts: living/nonliving things, plants, habitats, life cycles No new instruction; review only 	<ul style="list-style-type: none"> Daily activities for 15-20 minutes involve: reading books, videos, discussions, observations, hands-on activities, paper/pencil, and cut/paste Concepts: science notebooks, what is a scientist, observations with five senses, science tools and rules, seasons, weather conditions Integrated with Social Studies when applicable
Hannah	K	<ul style="list-style-type: none"> Did not get to do science very often Literacy and mathematics were the focus Incorporated in literacy stations through <i>Nearpod</i> lessons More video-based; less hands-on 	<ul style="list-style-type: none"> Online: <i>Nearpod</i> lessons Paper Packets: weather graphing activities At-home activities aligned to <i>Nearpod</i> lessons: make a rain gauge, make a pinwheel, simulate an earthquake Menus: one activity/day – simple activities to do at home without copies like taking a nature walk and observing with 5 senses Science Wednesdays through <i>Google Meet</i>: demonstrated experiments and shared directions to do at home – rain in a jar, salt volcano, elephant toothpaste, lava lamp, M&M rainbows in milk Concepts: weather, severe weather safety No new instruction; review only 	<ul style="list-style-type: none"> Teaches in virtual learning school Dedicated lessons for science each week; nothing formally submitted for grades Instruction presented through video recorded lessons using district curriculum resource <i>Discovery Education</i> Techbook Students record thinking, observations, responses in notebook at home Concepts: living things, how living things can change their environments to meet their needs STEM challenge: design a habitat for an egg
Sherry	1st	<ul style="list-style-type: none"> Project Lead the Way (PLTW) trained Lot of hands-on, discovery learning Used STEMscopes curriculum for science lessons PLTW and STEM challenges Dedicated instruction time; alternated weekly with Social Studies 	<ul style="list-style-type: none"> Online Choice Board – 4 options for science activities each week using videos, reading passages/books online No hands-on; more 'sit and get' No live or recorded instruction from teachers Concepts: living things, life cycles, food chains Review concepts weeks 1-2; new concepts introduced weeks 3-9 	<ul style="list-style-type: none"> Began with a district required unit for HIV AIDS curriculum that teaches about germs, how they spread, and staying safe Moved into science lessons using district curriculum resource STEMscopes Concepts: science safety and tools STEM activities integrated in literacy Alternates weekly with Social Studies Instructed to focus on literacy and mathematics to mind the gaps – no impact yet

Table 2 (Cont.)

Subject	Grade Level	In the Classroom Prior to Remote Learning	During Remote Learning	In the Classroom After Remote Learning
Abby	2nd	<ul style="list-style-type: none"> No set instructional time for Science – worked in when possible Integrated in literacy block during Read Aloud and/or Writing Used Mystery Science online curriculum Had started a project-based learning (PBL) unit on space right before closure – did not continue 	<ul style="list-style-type: none"> Lessons created by district literacy and mathematics facilitators for use district-wide Assigned on Fridays and alternated every 2 weeks with Social Studies – 4 lessons total Not required; Friday’s were ‘catch up’ days Lessons were interactive slideshows with videos, pictures, readings, and interactive response questions No hands-on activities Concepts: plants and habitats New standards/concepts presented 	<ul style="list-style-type: none"> New curriculum this fall; Science is integrated with Literacy Have not started the Science unit yet; it’s the third unit in the quarterly sequence First unit will be on Matter; doesn’t know what it will look like

Science Instruction Comparisons for Kindergarten thru 2nd Grade (Table 2): Science instruction in the classroom was not an emphasis in three of the four K-2 classrooms even before the changes in instruction caused by the pandemic. Sherry is the only K-2 teacher with a dedicated science instruction time prior to the remote learning experience. Her instruction was driven by hands-on learning and STEM lessons, using STEMscopes and Project Lead the Way curricular resources. Both the kindergarten teachers expressed literacy and mathematics were their focus and they did not do much science instruction in the classroom before remote learning. Hannah incorporated science activities during literacy workstations and Abby integrated science instruction in literacy when possible. Abby had started a PBL unit on Space prior to the beginning of remote learning and it was not continued during the remote learning experience.

All four teachers delivered instruction through online methods at some point in the remote learning experience. Sherry and Abby delivered online the entire experience. Sherry and Abby were able to present new learning while Anne and Hannah could not. Worksheets were used in paper packets by Hannah and Anne. All used videos, readings, and interactive components in their online learning activities. Anne and Hannah conducted science experiments

during their weekly videoconferences with students. Both shared the directions with students to do at home with their parents if materials were available. Sherry and Abby did not have any hands-on activities during the remote learning experience. Anne, Sherry, and Abby had activities involving concepts with plants and animals as living things, needs of living things, and classifying living and nonliving things. None of the subjects took grades on the science activities during remote learning. While students were encouraged to complete the activities, none were required.

I found an increase in science instruction with Anne and Hannah as they returned to school in the fall. Anne has 15-20 minutes of daily instruction and Hannah has weekly science lessons through their virtual learning classroom. Sherry also had weekly science instruction that alternates with social studies. Abby had not started science instruction yet. Anne, Hannah, and Sherry have all found ways to do hands-on science activities with the restrictions placed by COVID-19 or in the virtual setting. Anne and Sherry both introduced concepts around science safety and tools. Sherry has been instructed to focus on literacy and mathematics to mind the gaps from the spring, but that has not impacted their science time yet. Abby is learning how to apply a new literacy curriculum that consists of three three-week units each quarter, with one unit integrating science each quarter.

Science Instruction Comparisons for 3rd and 4th Grade (Table 3): Science instruction in the classroom prior to remote learning was not a priority for Lauren, because a literacy initiative consumed her instructional time. Bailee had dedicated science instructional time several times a week and Kelly's team was departmentalized, so her students received science instruction daily. Science instruction in Bailee and Linda's classrooms involved hands-on learning activities. Bailee's class had begun a PBL unit that was not continued during the remote learning period.

Table 3: Science Instruction Comparisons for the 3rd and 4th Grade Classrooms in the Study

Subject	Grade Level	In the Classroom Prior to Remote Learning	During Remote Learning	In the Classroom After Remote Learning
Bailee	3rd	<ul style="list-style-type: none"> Science instruction 2-3 times/week for 30 minutes Hands-on and inquiry based Had started a project-based learning (PBL) unit on sustainability right before closure – did not continue 	<ul style="list-style-type: none"> Paper Packets: reading passages and comprehension questions Online: lessons assigned through district curriculum resource <i>Discovery Education</i> Techbook; used some PBS streaming Online activities included videos, reading passages, interactive activities, and sample hands-on activities One lesson/week; not required Concepts: weather conditions, climates, natural weather hazards, environmental changes due to natural hazards No new instruction; review only 	<ul style="list-style-type: none"> 15 minutes/day for Science or Social Studies Has been told its integrated with literacy curriculum Incorporated lessons during morning work and intervention time - assigning lessons for independent work using district curriculum resource <i>Discovery Education</i> Techbook Concepts: landforms and how wind and water change the shape of land
Lauren	4th	<ul style="list-style-type: none"> No set instructional time for Science – worked in when possible Literacy initiative was priority and consumed instructional time May have 2 weeks/quarter with Science Followed district curriculum resource STEMscopes for lesson planning 	<ul style="list-style-type: none"> Lessons created by district literacy and mathematics facilitators for use district-wide Extension lessons; assigned on Friday Not required- optional; students chose 2 extension activities/week Lessons followed district curriculum pacing and used district curriculum resource STEMscopes Interactive slideshows with videos, exploration components from STEMscopes, pictures and student response activities No hands-on activities Concepts: natural hazards and their impact and changes in Earth’s surface due to weathering and erosion New standards/concepts presented 	<ul style="list-style-type: none"> NA – not in classroom; did not participate in fall interview
Kelly	4th	<ul style="list-style-type: none"> Departmentalized; taught by another teacher Hands-on activities, lab experiments, investigations 	<ul style="list-style-type: none"> Departmentalized; another teacher planned Science Paper Packets: worksheets on review concepts; limited to one page/week Online: used Google Forms for quizzes, worksheets uploaded from paper packets No hands-on activities No new instruction; review only 	<ul style="list-style-type: none"> Teaching 3rd grade Science in different district; departmentalized Four rotations/day; 75 minutes each; one rotation live streamed for virtual learners Hands-on activities and engineering challenges (with COVID-19 safety restrictions) First few weeks spent in review to assess possible gaps Concepts: science safety and tools, thinking like a scientist, science careers, matter and its characteristics, changes in matter, sound, and light

Science instruction during remote learning was minimal for all three teachers. Science lessons were presented once a week and were not required for Bailee's or Lauren's students. Lauren was able to present new learning, while Bailee and Kelly's lessons were review. Hands-on activities were not present in any of their lessons. Paper packets from Bailee and Kelly included worksheets with reading passages and related questions for students to answer. All of them delivered lessons online at some point in the experience. Bailee and Lauren both had lessons on natural hazards, however since they were not required for students to complete, we cannot know if students engaged with this content.

Science instruction after remote learning looks different for Bailee and Kelly. Kelly is departmentalized and teaches four rotations of science each day. Even with COVID-19 safety restrictions, Kelly has done hands-on activities and engineering challenges. Kelly was able to assess possible gaps in science during the first few weeks of school by engaging students in lessons and activities involving science standards from previous grades. She used a station format for students to rotate through various activities to demonstrate knowledge of previous years' standards as well as using formative assessment tasks that provided evidence of student understandings and misconceptions. Bailee has 15 minutes each day for science or social studies but is finding ways to incorporate independent science lessons in her student's morning work and intervention times. Lauren is not teaching in the classroom this fall.

Science Instruction Comparisons for 5th Grade (Table 4): Prior to remote learning, Daisy and Elizabeth's students received daily instruction in science that included hands-on learning activities and lab experiments coupled with reading passages and research of related science concepts. Elizabeth's students rotated between four teachers, with another teacher teaching science for 60 minutes each period. Both Daisy and Elizabeth's students were engaged in hands-

on activities and experiments. Daisy used the 5E instructional model for her instructional framework. Julie’s science instruction alternated on a quarterly basis with social studies and was not consistent. Her students completed independent, student-directed assignments, rather than hands-on activities. Julie and Daisy teach in the same district and both use their district purchased curriculum resource, *Discovery Education* Techbook.

Table 4: Science Instruction Comparisons for the 5th Grade Classrooms in the Study

Subject	Grade Level	In the Classroom Prior to Remote Learning	During Remote Learning	In the Classroom After Remote Learning
Julie	5th	<ul style="list-style-type: none"> • Instruction alternated quarterly with Social Studies • Different from previous years when they departmentalized • Last subject planned each week • Independent work-student directed; assigned through district curriculum resource <i>Discovery Education</i> Techbook 	<ul style="list-style-type: none"> • No Science standards paced for 4th quarter; instruction was minimal • Told to focus on literacy and mathematics • First two weeks: reviewed concepts assigned through district curriculum resource <i>Discovery Education</i> Techbook • Other activities included reading passages, videos, and interactive models • Concepts: Earth Day and water cycle; were not aligned to grade level standards • No new instruction; review only 	<ul style="list-style-type: none"> • ‘Non-existent’ • Small group instruction for reading and mathematics intervention occurring during their science instructional time • Literacy and mathematics are the focus • Has been told its integrated with literacy curriculum • Some independent learning through district curriculum resource <i>Discovery Education</i> Techbook • Concepts: patterns in the night sky
Daisy	5th	<ul style="list-style-type: none"> • Daily instruction; sometimes alternated with Social Studies • Use the 5E instructional model; KLEWS chart • Hands-on activities and experiments; reading passages and videos • Followed district curriculum pacing and used the district curriculum resource <i>Discovery Education</i> Techbook 	<ul style="list-style-type: none"> • Instruction was minimal; one lesson/week • Told to focus on literacy and mathematics • Paper packets: reading passages and simple activities to do at home • Online: activities linked from PBS streaming services provided by Arkansas DoE for remote learning • Science experiments in weekly <i>Zoom</i> meetings • STEM challenge: design/test a catapult • Concepts: Energy, bees, pollination • No new instruction; review only 	<ul style="list-style-type: none"> • Had not started yet – finishing Social Studies unit • Literacy and mathematics are the focus • Has been told its integrated with literacy curriculum • Some discussions about patterns in the night sky (first science unit) through their read aloud • Not sure what hands-on activities will look like with COVID-19 safety restrictions

Table 4 (Cont.)

Subject	Grade Level	In the Classroom Prior to Remote Learning	During Remote Learning	In the Classroom After Remote Learning
Elizabeth	5th	<ul style="list-style-type: none"> • Departmentalized; taught by another teacher • Four rotations/day; 60 minutes each • Hands-on activities, lab experiments, investigations • Interactive notebooks 	<ul style="list-style-type: none"> • Departmentalized; planned by the Science content team; uploaded by Elizabeth • Daily assignments from science workbook that included reading passages and related questions for response • Assignments were not graded • No new instruction; review only 	<ul style="list-style-type: none"> • Departmentalized; taught by another teacher • Four rotations/day; 60 minutes each; one rotation for virtual learners • Hands-on activities and engineering challenges (with COVID-19 safety restrictions) • Uses district purchased textbook and workbook by Houghton Mifflin Hill • Incorporates online learning resources: Generation Genius, Explore Learning Gizmos, Mystery Science, Flocabulary • Science supplies were purchased for virtual learners • Concepts: physical and chemical changes in matter • Engineering Challenges: paper airplane launch, tower power, parachute drop

Science instruction during remote learning was minimal for all teachers in this group.

Elizabeth’s students received daily assignments from their science workbooks, but they were not graded. None of the subjects were able to present new concepts during remote learning. Julie and Daisy were both told to focus on literacy and mathematics during remote learning. Daisy used resources provided by the Arkansas Department of Education through PBS streaming services for a portion of her science instruction in remote learning. She also demonstrated a few science experiments in her weekly videoconference meetings. Daisy’s students had the opportunity to complete a STEM challenge designing and testing a catapult with their families. This was the only hands-on activity offered by any of these three subjects during remote learning.

Elizabeth’s class is the only 5th grade class of those in this study to start science instruction this fall. Her students receive 60 minutes a day of science instruction, taught by another teacher on her team. Even with COVID-19 safety restrictions, students have engaged in hands-on activities and engineering challenges. Neither Julie nor Daisy had started science

instruction at the time of our fall interview. Both have been told that literacy and mathematics are their instructional focus this year and that their science instruction is embedded with their literacy curriculum. Their first science unit involves patterns in the night sky, and both have given introductory time to this concept. Daisy is unsure of what hands-on learning will look like with COVID-19 restrictions, while Julie said her science instructional time is being used for small group literacy and mathematics intervention.

Science Instruction Comparison Across All Grades:

Prior to the remote learning experience during the COVID-19 pandemic, five teachers had a dedicated science instructional time: Sherry, Bailee, Kelly, Daisy, and Elizabeth. Kelly and Elizabeth both taught with teams who were departmentalized and delivered science instruction daily. All five teachers engaged students in hands-on learning activities, investigations, and experiments. Anne, Hannah, Abby, Lauren, and Julie all had inconsistent science instruction, fitting it in when possible. Anne, Hannah, and Lauren claimed literacy and/or mathematics was the focus for their instructional time in the classroom. Abby and Bailee had both started a PBL unit just before remote learning began and did not continue the unit during remote learning. Sherry was trained in *Project Lead the Way* and provided opportunities for her students to participate in STEM or engineering activities each week. These activities engaged students in hands-on experiences with engineering and provided opportunities for content in the areas of science, technology, engineering, and mathematics to be integrated for learning.

Sherry, Abby, and Lauren were able to present new concepts during remote learning, while the other seven subjects had to review concepts previously addressed. Science experiments were demonstrated and shared by Anne, Hannah, and Daisy in their weekly videoconference meetings with students. Anne and Hannah used these experiments as at-home projects with their

families, and Daisy incorporated a STEM catapult challenge as a family-involvement activity. Paper packets were used by six subjects during the experience and involved worksheets with reading passages and questions for students to answer. Bailee and Daisy both used *PBS* streaming services provided through the Arkansas Department of Education. Through *PBS Kids*, age-appropriate television programming aligned to reading, mathematics, and science was available for teachers to link and use in their remote instruction. Episode of programs, like *Sid, the Science Kid*, were available for streaming, and learning activities and resources connected to the programs were available to teachers. Elizabeth's students received daily assignments, while Anne, Hannah, Sherry, Abby, Bailee, Kelly, Lauren, and Daisy provided weekly assignments. Julie's science activities were sporadic and unrelated to grade-level standards. Abby and Lauren's district literacy and mathematics facilitators created lessons for each grade level to use district wide. The lessons were posted on Fridays and were considered optional or extension lessons. Hands-on activities were demonstrated by three subjects during videoconferences, and Daisy was the only subject to present a hands-on, STEM activity as a science assignment.

Upon their return to school in the fall, Kelly and Elizabeth are still departmentalized and their students receive daily instruction in science. Anne has 15-20 minutes of dedicated science time daily, while Hannah and Sherry have dedicated time on a weekly basis. Bailee has only 15 minutes each day for science or social studies and integrates some independent science work in other times of the day. Abby, Julie, and Daisy had not started science instruction at the time of interview. Hannah teaches only in the virtual environment and Kelly and Elizabeth have one virtual class rotation each day. All three have engaged students in hands-on activities at-home and through virtual experiences. Anne, Sherry, Kelly, and Elizabeth have engaged students in hands-on learning in the classroom, with COVID-19 safety restrictions. Sherry, Julie, and Daisy

were all told to focus on literacy and mathematics instruction as they returned to school. Sherry's science instruction has not been impacted yet and has continued as planned. Anne, Sherry, Kelly, and Elizabeth all conducted lessons around science safety, tools, and procedures at the beginning of the year. Sherry, Kelly, and Elizabeth have engaged their students in engineering challenges as well.

Results related to Research Question 2

What were elementary teachers' experiences as they pivoted from onsite classroom instruction to delivering instruction via remote methods during early response to the COVID-19 pandemic?

Data are provided in tables categorized by specific topics of discussion in the interviews that align with the sub questions associated with Research Question 2. Each table summarizes the findings from the individual case reports with cross-case findings presented.

Instructional Delivery Methods During Remote Learning

Subjects used a variety of delivery methods during the remote learning experience. Table 5 presents their delivery options for assignments, provides the number of students using each option, and tells the platform each subject used for online delivery.

All the subjects used an online delivery method at some point during the remote learning experience. Online delivery was the only method of delivery for four subjects: Sherry, Abby, Lauren, and Julie. The online delivery method was a district-wide decision for Sherry, Abby, and Lauren, while Julie's was a school-wide decision. Anne, Bailee, Daisy, and Elizabeth transitioned to online methods after the second or third week of remote learning, with the first two to three weeks as practice with online delivery of the work they sent home in packets. Both Anne and Abby had special circumstances that involved sending paper packets to students even

though the district was using an online delivery method. Paper packets and online options were available, per district guidelines, for Hannah, Bailee, Kelly, Daisy, and Elizabeth to accommodate those who did not have internet access. Kelly had more students completing paper packets than using online delivery.

Table 5: Instructional Delivery Methods of Remote Learning, Spring 2020

Subject	Grade Level	Assignment Delivery Options	Number of Students/Option	Delivery Platform
Anne	K	<ul style="list-style-type: none"> Paper packets mailed to students for weeks 1-3 District transitioned to online learning weeks 4-9 	2 paper* 14 online	<i>Schoology</i>
Hannah	K	<ul style="list-style-type: none"> Paper packets and online options available; teacher choice until week 5 Online learning delivered through <i>Nearpod</i> lessons until week 5 School transitioned to a menu board of activities in week 5; menu board was available in paper format and through an electronic link emailed to parents 	8 paper 10 online	<i>Nearpod</i> & Parent Email
Sherry	1st	<ul style="list-style-type: none"> Online only – district decision Choice boards with hyperlinks to activities emailed to parents weekly 	18 online	Parent Email
Abby	2nd	<ul style="list-style-type: none"> Online only – district decision 	1 paper** 19 online	<i>Google Classroom</i>
Bailee	3rd	<ul style="list-style-type: none"> Paper packets for everyone weeks 1-2; paper packet options available weeks 3-9 Online options available starting week 3 – teacher choice Used weeks 1 and 2 to practice online learning procedures and transitioned online in week 3 	3 paper 17 online	<i>Google Classroom</i>
Lauren	4th	<ul style="list-style-type: none"> Online only – district decision 	26 online	<i>Google Classroom</i>
Kelly	4th	<ul style="list-style-type: none"> Paper packets and online option available entire experience District encouraged online delivery 	50 paper 10 online	<i>Google Classroom</i>
Julie	5th	<ul style="list-style-type: none"> Online only – school decision 	22 online	<i>Google Classroom</i>
Daisy	5th	<ul style="list-style-type: none"> Paper packets for everyone weeks 1-2; paper packet options available weeks 3-9 Online options available starting week 3 – teacher choice Used weeks 1 and 2 to practice online learning procedures and transitioned online in week 3 	5 paper 23 online	<i>Google Classroom</i>
Elizabeth	5th	<ul style="list-style-type: none"> Paper packets for everyone weeks 1-2; paper packet options available weeks 3-9 Online options available starting week 3 – teacher choice Used weeks 1 and 2 to practice online learning procedures and transitioned online in week 3 	15 paper 104 online	<i>Google Classroom</i>

*paper packet mailed due to lack of internet services

**paper packet used due to special services required for student

Google Classroom was the predominant online delivery platform, used by seven subjects. Anne was the only subject to use *Schoology*, and Hannah was the only subject to use *Nearpod*. Parent email was used to send links to parents by Sherry for the entire experience and by Hannah starting in week five. Hannah’s instruction was initially delivered online via *Nearpod*

but changed in Week Five to a menu providing a calendar of basic activities to do at home each week that was sent to parents through email.

Synchronous Videoconferences and Student Participation During Remote Learning

One of the ways teachers engaged students during remote learning was through synchronous videoconferences. A variety of videoconferencing tools was used by subjects and Table 6 presents a summary of these tools and whether the subject hosted meetings for the whole class, small groups of students, or a combination of both formats. It also shares how often the meetings occurred and the length of those meetings. The subjects used these meetings for different purposes and the focus of those meetings is also provided. Table 7 provides a summary of student participation in each subject's videoconferences and a summary of student completion of weekly assignments.

Google Meet videoconferencing was used by six subjects, while three participants used *Zoom*. Anne used a conferencing tool embedded in the *Schoology* learning management system. Five subjects hosted videoconferences for their whole class and two subjects hosted videoconferences for small groups of students. Lauren and Julie hosted meetings in both formats. Bailee's team hosted meetings for the entire grade level. Bailee, Julie, and Daisy hosted daily meetings for their whole class lasting for 30 minutes. Sherry and Lauren hosted one whole class meeting each week that lasted for at least 30 minutes. Lauren and Julie hosted small group meetings throughout the week that provided differentiated instruction in mathematics and reading, while Anne's small groups were designed for social-emotional purposes. Social-emotional engagement was the predominant purpose of the videoconferences, ensuring that students were able to interact and connect socially with one another. Interactive games,

scavenger hunts, show and tell, and opportunities for students to share about their feelings were included in subjects’ social-emotional engagement meetings. Whole class meetings for Bailee and Daisy offered some instruction along with social-emotional engagement, and Hannah’s whole class meetings offered social-emotional engagement around a content-based theme each day. Kelly was available twice a week for an hour to offer tutoring or instructional support to students, and Elizabeth only used videoconferences on an as-needed basis for technology or remote learning procedure support.

Table 6: Synchronous Videoconferences Offered during Remote Learning, Spring 2020

Subject	Grade Level	Videoconferencing Tool	Group Format	Frequency & Duration	Focus
Anne	K	<i>Schoology</i> Conferences	Small group	2-3 times/week 30 minutes	Social-Emotional
Hannah	K	<i>Google Meet</i>	Whole class	4 times/week 30 minutes	Social-Emotional with content focused days T-Specials area; W-Science; Th-Math; F-Reading
Sherry	1st	<i>Zoom</i>	Whole class	1 time/week 30 minutes	Social-Emotional
Abby	2nd	<i>Google Meet</i>	Whole class	2 times/week 30 minutes	Social-Emotional
Bailee	3rd	<i>Google Meet</i>	Grade level	Daily 30 minutes	Social-Emotional with some instruction
Lauren	4th	<i>Google Meet</i>	Whole class & Small group	WG: 1 time/week 30 mins – 1 hour SG: 4 groups 1 time/week 30 minutes	Whole group: Social-Emotional Small groups: Differentiated Instruction in Math & Reading
Kelly	4th	<i>Google Meet</i>	Small group	2 times/week 1 hour	Tutoring/Instructional Support as needed
Julie	5th	<i>Zoom</i>	Whole class & Small group	WG: Daily 30 minutes SG: 5 groups 1 group/day 30 mins	Whole group: Social-Emotional Small groups: Differentiated Instruction in Math & Reading
Daisy	5th	<i>Zoom</i>	Whole class	Daily 30 minutes	Social-Emotional with some instruction
Elizabeth	5th	<i>Google Meet</i>	Whole class	As needed	Technology or Procedure Support

Student participation in videoconferences (Table 7) was optional in the classes of all subjects. Kelly and Elizabeth did not hold regular class or small group videoconferences. Julie saw the highest percentage of student participation in class videoconferences (86%) while Abby showed the lowest percentage of student participation in class videoconferences (30%). Julie also

showed the highest percentage of student completion of assignments (95%), with Anne showing the second highest percentage of assignment completion (94%). Daisy had the lowest percentage of student assignment completion (29%).

Table 7: Degrees of Student Participation during Remote Learning, Spring 2020

Subject	Grade Level	Total students* (n)	Participation in Videoconferences	% of n	Completion of Assignments	% of n
Anne	K	16	<ul style="list-style-type: none"> Average of 12 students/week Slight drop in participation weeks 7, 8, 9 	75%	<ul style="list-style-type: none"> 15 submitted assignments each week 	94%
Hannah	K	18	<ul style="list-style-type: none"> Average of 11 students/day Slight drop in participation week 6 	61%	<ul style="list-style-type: none"> 13 submitted assignments weeks 1-4 No way to measure completion of assignments for weeks 5 -9 or for the 5 students receiving packets weeks 1-4 	72%
Sherry	1st	18	<ul style="list-style-type: none"> Average of 14 students/week No drop in participation 	78%	<ul style="list-style-type: none"> Average of 13 submitted assignments weeks 3-9 No way to measure completion of assignments for weeks 1-2 Slight drop in completion of work during week 7 	72%
Abby	2nd	20	<ul style="list-style-type: none"> Average of 6 students/meeting Slight drop in participation weeks 5 & 6 	30%	<ul style="list-style-type: none"> Average of 15 submitted assignments each week Slight drop in completion of work during week 5 	75%
Bailee	3rd	20	<ul style="list-style-type: none"> Average of 12 students/day Slight drop in participation week 5 	60%	<ul style="list-style-type: none"> Average of 15 submitted assignments each week Slight drop in completion of work during week 7 	75%
Lauren	4th	26	<ul style="list-style-type: none"> Average of 4 students/small group (1 group/day = average 20 students/week) Slight drop in participation weeks 4 & 5 	77%	<ul style="list-style-type: none"> Average of 23 submitted assignments each week Slight drop in completion of work during week 7 	88%
Kelly	4th	60	<ul style="list-style-type: none"> Average of 3 students/week for tutoring or instructional support as needed 	5%	<ul style="list-style-type: none"> No way to measure completion of assignments with paper packets until end – 80% returned packets 	80%
Julie	5th	22	<ul style="list-style-type: none"> Average of 19 students/day Slight drop in participation starting week 7 	86%	<ul style="list-style-type: none"> 21 submitted assignments each week 	95%
Daisy	5th	28	<ul style="list-style-type: none"> Average of 14 students/day No drop in participation 	50%	<ul style="list-style-type: none"> Average of 8 submitted assignments each week Inconsistent submission of work – higher submission in mathematics 	29%
Elizabeth	5th	119	<ul style="list-style-type: none"> Did not hold regular meetings 	NA	<ul style="list-style-type: none"> Average of 55 submitted assignments online weeks 3-9 No way to measure completion of assignments for weeks 1-2 or for 15 students receiving packets throughout Slight drop in completion of work during week 5 	53%

*total number of students in class; not all students participated online

Student participation in videoconference dropped for most subjects in Weeks Four through Seven, with Anne seeing a drop that started in Week Seven and never returned. Sherry

and Daisy did not see drops in student participation of videoconferences. Student completion of assignments remained consistent throughout the experience for Anne and Julie. Abby and Elizabeth saw a slight drop in completion of assignments in Week Five while Sherry, Bailee, and Lauren saw a slight drop in completion of assignments in Week Seven. Daisy's students were inconsistent with their completion of assignments while Hannah and Kelly had no way to measure weekly completion of assignments. Abby saw a slight drop in both student participation of videoconferences and completion of work in Week Five. Bailee saw a slight drop in student participation of videoconferences in Week Five and a drop in completion of work in Week Seven. Lauren's student participation in videoconferences dropped in Weeks Four and Five, while their completion of work dropped in Week Seven. Anne saw student participation in videoconferences drop beginning in Week Seven, continuing through the end of the experience, but the student submission of assignments remained consistent throughout the experience.

Communication with Parents during Remote Learning

Subjects communicated with their parents using a variety of methods and for different reasons. Table 8 provides a summary of these communication methods and the frequency in which subjects communicated with their parents. It also presents the main purposes for each subject's regular communication and a summary of parent responses during the experience.

Each of the subjects chose their method of communication with parents. Six subjects used application tools as their primary method to communicate with parents: Hannah and Julie used Remind; Bailee, Kelly, Daisy, and Elizabeth used *Class Dojo*. Sherry, Abby, and Lauren used email to communicate with parents while Anne used a combination of email, text, phone calls

and *Schoology* messages. Anne also used the Google Voice system which provided her a way to communicate via phone and text without compromising her personal phone number.

Table 8: Nature of Communication with Parents during Remote Learning, Spring 2020

Subject	Grade Level	Communication Method	Frequency	Purpose	Parent Responses
Anne	K	Email, text, phone, <i>Schoology</i> messages Google Voice	Daily	<ul style="list-style-type: none"> Reminders for the day Supplemental activities to do together at home 	<ul style="list-style-type: none"> General questions about work; student struggles Week 4 – lot of communication about the transition to eLearning Decreased in week 7
Hannah	K	Remind Email/phone – a few	Daily	<ul style="list-style-type: none"> Morning messages with overview of day, any changes Reminders of <i>Google Meets</i> 	<ul style="list-style-type: none"> First few weeks – lot of daily interaction; questions about expectations Week 4 – questions about change in delivery method Decreased around week 5
Sherry	1st	Email	Daily	<ul style="list-style-type: none"> Sunday email with choice boards for the week linked Updates or news to share 	<ul style="list-style-type: none"> Mondays were frustrating with technology links from choice boards sent Sunday night Decreased after week 4
Abby	2nd	Email	2-3 times/week	<ul style="list-style-type: none"> Sunday newsletter – preview of upcoming week Student progress updates 	<ul style="list-style-type: none"> First few weeks – frustrating, lots of questions/technology issues Decreased after week 3
Bailee	3rd	<i>Class Dojo</i> Email – a few	Daily	<ul style="list-style-type: none"> Class/school updates Changes in routines/procedures Personal messages about student progress or participation concerns 	<ul style="list-style-type: none"> First two weeks – questions about expectations, what to do Weeks 3 & 4 – questions about technology and Chromebooks Decreased by week 5 as they got into routines
Lauren	4th	Email phone – a few	2-3 times/week	<ul style="list-style-type: none"> Sunday’s – preview of upcoming week with video message Schedules, meeting times Student progress emails 	<ul style="list-style-type: none"> First two weeks – questions about expectations, workload, changes Decreased by week 3 as they got into the routine
Kelly	4th	<i>Class Dojo</i> Email/phone – a few	2-3 times/week	<ul style="list-style-type: none"> Class/school updates Well-being check-ins 	<ul style="list-style-type: none"> First two weeks – flooded with questions about expectations and procedures Decreased by week 3 as they got into routines
Julie	5th	Remind	Twice/day AM & PM	<ul style="list-style-type: none"> AM – overview of daily activities PM – wrap up for school day with interaction question Reminders of <i>Zoom</i> meetings 	<ul style="list-style-type: none"> First few weeks – technology issues & concerns Messages from parents decreased around week 4
Daisy	5th	<i>Class Dojo</i> Email/text – a few	Daily	<ul style="list-style-type: none"> Class updates Encouragement & Student Shout-outs Weekly progress reports 	<ul style="list-style-type: none"> Parent concerns with work requirements or student completion of work Consistent messages thru week 7
Elizabeth	5th	<i>Class Dojo</i>	2-3 times/week	<ul style="list-style-type: none"> Class updates District news and resources for parents Tutorials for technology and work submission 	<ul style="list-style-type: none"> First two weeks – overwhelmed with questions about the work, procedures, technology Decreased by week 4 as they got into the routine

Messages were sent once a day by five subjects while Julie sent two messages each day to parents. Abby, Lauren, Kelly, and Elizabeth sent messages two to three times a week. Sherry,

Abby, and Lauren sent communication to parents each Sunday to prepare them for the upcoming week, providing links to assignments or resources and expectations for the work to be completed. Abby, Bailee, Lauren, and Daisy all sent student progress reports to parents on a weekly basis. Most subjects communicated overviews of the day or class updates in their communication. Anne sent supplemental activities for parents to do at home with their children and Elizabeth sent tutorials for working with the technology and assignments.

Parent responses centered around questions they had about their student's work and technology issues they were experiencing. All the subjects reported a decrease in communication from parents over the durations the experience: Abby, Lauren, and Kelly saw a decrease in Week Three; Sherry, Julie, and Elizabeth saw a decrease in Week Four; Hannah and Bailee saw a decrease in Week Five; and Anne and Daisy saw a decrease in Week Seven. Anne and Daisy had consistent communication from parents until Week Seven, while the other subjects report their communication decreased as they became familiar with routines. Abby, Lauren, and Kelly had changes to their instructional expectations or delivery in week two and saw parent communication decrease in week three. Sherry, Julie, and Elizabeth had changes to their instructional delivery or expectations after Week Two and saw decreased communication after Week Four. Hannah's instructional delivery method changed after Week Four and parent communication decreased in the week following that change. Bailee's instructional delivery changed after Week Two but continued to see struggle with the online delivery through Week Five.

Administrative Expectations Communicated During Remote Learning

Expectations and guidelines for attendance, grading, and student engagement in instruction varied for subjects during the experience. A summary of those expectations is presented in Table 9.

Table 9: Administrative Expectations Communicated during Remote Learning, Spring 2020

Subject	Grade Level	Attendance	Grades	Instruction or Engagement
Anne	K	<ul style="list-style-type: none"> Weeks 1-3: Packet completion Weeks 4-9: 3 assignments/week 	<ul style="list-style-type: none"> Kindergarten did portfolios Other grade levels – carrying 3rd quarter grades over to 4th quarter 	<ul style="list-style-type: none"> No new instruction; review only Use mid-year assessment data to determine focus for review
Hannah	K	<ul style="list-style-type: none"> No expectations shared 	<ul style="list-style-type: none"> Carry 3rd quarter grades over to 4th quarter 	<ul style="list-style-type: none"> No new instruction; review only
Sherry	1st	<ul style="list-style-type: none"> Based on weekly assignment submission 	<ul style="list-style-type: none"> Used a pass/fail system for weekly assignments 4th quarter scoring changed from a 4pt mastery-based scale to a pass/ fail score Could not penalize students during the experience – so no fails were given 	<ul style="list-style-type: none"> Review during weeks 1 & 2 New instruction weeks 3-9 Priority standards for instruction provided for weeks 3-9 District scheduled their instructional week by grade level 5 weekly lessons in reading, phonics, writing, mathematics, and science/social studies
Abby	2nd	<ul style="list-style-type: none"> Submit one assignment a day 	<ul style="list-style-type: none"> Carry 3rd quarter grades over to 4th quarter Continue to score essential standards scored in 4th quarter 	<ul style="list-style-type: none"> New instruction all weeks District-wide schedule: M/W – literacy; T/Th – mathematics; Friday – extensions/catch-up
Bailee	3rd	<ul style="list-style-type: none"> No expectations shared 	<ul style="list-style-type: none"> Carry 3rd quarter grades over to 4th quarter 	<ul style="list-style-type: none"> No new instruction; review only
Lauren	4th	<ul style="list-style-type: none"> Submit one assignment a day 	<ul style="list-style-type: none"> Carry 3rd quarter grades over to 4th quarter Team determined assignments scored each week based on 4th quarter essential standards 	<ul style="list-style-type: none"> New instruction all weeks District-wide schedule: M/W – literacy; T/Th – mathematics; Friday – extensions/catch-up
Kelly	4th	<ul style="list-style-type: none"> Based on return of completed packets or weekly online assignments 	<ul style="list-style-type: none"> Carry 3rd quarter grades over to 4th quarter 	<ul style="list-style-type: none"> New instruction in ELA and mathematics; review in science & social studies School expectation: 45 mins/day in ELA and mathematics; 30-45 mins/day for science or social studies
Julie	5th	<ul style="list-style-type: none"> No expectations shared 	<ul style="list-style-type: none"> Carry 3rd quarter grades over to 4th quarter 	<ul style="list-style-type: none"> No new instruction; review only School expectations: 2 hours/day of instruction that included 30-minute <i>Zoom</i> meetings for SEL
Daisy	5th	<ul style="list-style-type: none"> No expectations shared 	<ul style="list-style-type: none"> Carrying 3rd quarter grades over to 4th quarter Carrying 3rd quarter grades over to 4th quarter 	<ul style="list-style-type: none"> No new instruction; review only School encouraged SEL engagement in videoconferences
Elizabeth	5th	<ul style="list-style-type: none"> No expectations shared 		<ul style="list-style-type: none"> No new instruction; review only District expectations: 90 mins of core instruction/day (about 20 minutes for each subject)

Attendance: Attendance guidelines were provided for Anne, Sherry, Abby, Lauren, and Kelly. These guidelines involved the submission of a specific number of assignments each week or the completion of paper packets. Five subjects, Hannah, Bailee, Julie, Daisy, and Elizabeth, who all worked in Arkansas, were not provided guidelines for taking attendance during remote learning. Four of those subjects worked in District 1. All three Texas subjects were given guidelines for attendance. Abby and Lauren, who were given guidelines for attendance, both work for District 2 in Arkansas.

Grades: Sherry is the only subject who did not carry over third quarter grades to fourth quarter. They used a pass/fail scoring system for fourth quarter grades yet were not allowed to penalize a student during the experience, so all the students were given passing scores. Abby and Lauren continued to score district determined essential standards for the fourth quarter while carrying over third quarter grades for additional standards.

Instruction/Engagement: Sherry, Abby, Lauren, and Kelly continued student learning with new instruction during remote learning, while the other six subjects provided review of concepts previously learned. Sherry did review for the first two weeks of remote learning before they transitioned into their new learning and delivery method. Kelly's school only provided new instruction in literacy and mathematics, with science and social studies as review. Anne's district asked them to use their mid-year assessment data to determine which concepts they would provide for review during remote learning.

Abby and Lauren were provided a district-wide schedule for instructional delivery devoting two days to literacy, two days to mathematics, and one day for catch-up and extension lessons. Sherry's district provided a pacing of their priority standards for instruction that began

in week three. They were to have a total of five weekly lessons, one lesson in each of the following areas: reading, phonics, writing, mathematics, and science/social studies. These lessons could not require more than an hour of work-at-home time. Kelly's school set daily instructional time guidelines: 45 minutes each day in literacy and mathematics, and 30 to 45 minutes in science or social studies each day. Elizabeth's district set an expectation of 90 minutes of core instruction each day, or about 20 to 25 minutes each day for reading, writing, mathematics, and science. Julie's school set an expectation for two hours of instruction each day, which included their whole class and small group videoconference meetings. No instructional expectations were provided for Anne, Hannah, Bailee, or Daisy. Daisy's principal requested they encourage student participation in videoconferences and the focus be on social-emotional engagement, but no specific expectation or guideline for engagement was given.

Support Provided to Subjects during Remote Learning

Support is provided on many levels during the school year. Four levels of support are summarized and discussed in this section: school level support, team level support, district level support, and state level support. Table 10 provides a summary of the support that subjects received during remote learning from their school leaders. Table 11 provides a summary of the support that subjects received from their teammates. Table 12 provides a summary of the support subjects received from their district, and Table 13 provides a summary of the support subjects received from their state.

School Level Support (Table 10): All the subjects reported having very supportive and responsive school leaders (principal or assistant principal) during remote learning.

Table 10: School Level Support Provided to Teachers during Remote Learning, Spring 2020

Subject	Grade Level	Support: School Level
Anne	K	<ul style="list-style-type: none"> • Principal supportive and responsive to concerns • Assisted in contacting parents • Encouraged Anne and promoted her tenacity with <i>Schoology</i> • Some virtual staff meetings
Hannah	K	<ul style="list-style-type: none"> • Principal was supportive of her efforts with online learning • Maintained a positive and uplifting culture • Changed to a school-wide delivery method week 5
Sherry	1st	<ul style="list-style-type: none"> • Principal was 'phenomenal' • Trusted what worked for them, gave flexibility • Disseminated information in an organized manner • Weekly virtual staff meetings
Abby	2nd	<ul style="list-style-type: none"> • Principal was supportive and good at communicating • Allowed them to determine how to do certain things • Principal was added to all <i>Google Classrooms</i> to support teachers and 'stay in the know' • Occasional virtual staff meeting
Bailee	3rd	<ul style="list-style-type: none"> • Principal was supportive and encouraging • Provided daily email updates, answered questions • Principal, assistant principal, literacy and mathematics facilitators did the manual work assembling paper packets and distributing devices • Weekly virtual PLC meetings
Lauren	4th	<ul style="list-style-type: none"> • Principal was supportive and responsive to needs • Principal was added to all <i>Google Classrooms</i> in the building • Helped with parent contact as needed • Weekly virtual PLC meetings
Kelly	4th	<ul style="list-style-type: none"> • Principal was ill during most of experience – assistant principal stepped in • Available and supportive; assisted with parent contact • Weekly virtual staff meetings
Julie	5th	<ul style="list-style-type: none"> • Principal was active and highly involved; supportive and encouraging • Principal is 'transparent and great disseminator of info' • Purchased technology needed • Weekly virtual staff & leadership team meetings
Daisy	5th	<ul style="list-style-type: none"> • Principal was supportive and responsive • Sent a lot of emails at the beginning with resources and options – slowed down later • Admin attended team meetings
Elizabeth	5th	<ul style="list-style-type: none"> • Principal gave guidelines to follow but trusted their decisions • Supportive and responsive • Asked for input with decisions • Did not micromanage • Continued weekly PLC meetings • Admin attended team meetings

Bailee's leadership team (principal, assistant principal, literacy facilitator, and mathematics facilitator) did the manual work of assembling and distributing their packets each week. Julie's principal purchased several technology items for them to use with remote learning, including headphones with attached microphone, mobile hotspots, and a school license for *Screencastify*, a screen recording tool to make instructional videos. Sherry, Kelly, and Julie had weekly virtual staff meetings, and Anne and Abby had occasional virtual staff meetings. Bailee,

Lauren, and Elizabeth attended weekly virtual PLC meetings as a continuation of their normal school routines. Hannah and Daisy did not have weekly meetings with their administrators or staff, however, Daisy’s principal attended one of their team meetings each week.

Table 11: Team Level Support Provided to Teachers during Remote Learning, Spring 2020

Subject	Grade Level	Support: Team Level
Anne	K	<ul style="list-style-type: none"> • Great to work with • Provided emotional support – watching out for each other • Weekly planning meetings
Hannah	K	<ul style="list-style-type: none"> • Great emotional support system • First four weeks – divided the planning • Following week 4 - planned weekly menu activities alone
Sherry	1st	<ul style="list-style-type: none"> • Worked very well together • Divided planning duties and worked collaboratively • Met several times a week • Provided mental and emotional support to each other
Abby	2nd	<ul style="list-style-type: none"> • Supportive and worked well together • Divided planning duties and worked collaboratively • Weekly planning meetings • Trust each other
Bailee	3rd	<ul style="list-style-type: none"> • Unified unit, work well together • Divided the workload with planning and hosting daily grade level <i>Google Meets</i> • Weekly planning meetings • Stepped in and took care of her class needs in week 8 when a personal issue took her away from work
Lauren	4th	<ul style="list-style-type: none"> • Worked well together • Divided the planning and recording of lessons in each component • Constant contact with each other • Weekly planning sessions
Kelly	4th	<ul style="list-style-type: none"> • Worked well together • Planned twice a week and prepared packets together • Divided roles with packet prep and distribution
Julie	5th	<ul style="list-style-type: none"> • Worked well together • Dividing planning responsibilities • Taught each other tech skills • Supportive and encouraging • Daily planning meetings • Campus facilitators provided the first 10 days of lessons for all grade levels
Daisy	5th	<ul style="list-style-type: none"> • Worked well together • Divided up planning responsibilities weekly • Taught each other tech skills • Colleagues in SpEd and ESOL worked alongside her • Campus mathematics facilitator supported with resources and lessons; hosted mathematics talks in her <i>Zoom</i> meetings
Elizabeth	5th	<ul style="list-style-type: none"> • Two teams – each met weekly • Both teams supported and encouraged each other • Quad team had disagreements and had to make some compromises • Content team was safe place to bounce ideas and make transition plans

Team Level Support (Table 11): All the subjects reported having a team that worked well together and provided support to each other during the experience. Planning responsibilities during remote learning were shared by all teams except for Anne’s where her plans were created

at the district level. Hannah’s team stopped dividing responsibilities after Week Four when they switched delivery methods. Hannah planned all the activities for the menu board alone. Elizabeth worked with two teams: her quad team that provided the departmentalized instruction for a set group of fifth grade students, and her content team that planned the instruction for writing for all the fifth-grade students. Elizabeth had some difficulties with her quad team, but they were able to arrive at a compromise. Anne, Abby, Bailee, Lauren, Daisy, and Elizabeth all met on a weekly basis with their teams. Kelly met with her team twice a week; Sherry met with her team several times a week; and Julie met daily with her team. While Hannah’s team did not continue planning together, they were in contact with each other throughout the experience.

District Level Support (Table 12): All subjects spoke of the support and encouragement given by their superintendents. Abby and Lauren both spoke of how their superintendent adjusted their instructional schedule and student workload in week two based on the feedback received from parents. Anne, Sherry, Abby, and Lauren had consistent district-wide expectations and schedules. Curricular support was provided to Anne, Sherry, Abby, Lauren, and Elizabeth in the form of lesson plans, instructional schedules, or district curriculum specialists attending meetings. Bailee, Julie, and Daisy also reported their campus literacy and mathematics facilitators provided curricular support with resources or lesson plans. No curricular support from a district level was provided to Hannah, Bailee, Kelly, Julie, or Daisy.

Table 12: District Level Support Provided to Teachers during Remote Learning, Spring 2020

Subject	Grade Level	Support: District Level
Anne	K	<ul style="list-style-type: none"> • Superintendent supportive and responsive • Wanted consistency across district • Plans were designed by teams of teachers for use district-wide
Hannah	K	<ul style="list-style-type: none"> • Superintendent gave updates and messages of encouragement • Weekly meetings with principals • No curricular support • District technology specialists provided trainings

Table 12 (Cont.)

Subject	Grade Level	Support: District Level
Sherry	1st	<ul style="list-style-type: none"> • Superintendent supportive and encouraging • C&I team designed instructional plans for weeks 1 & 2 • C&I team developed plan for priority standards through remote learning
Abby	2nd	<ul style="list-style-type: none"> • Superintendent supportive prior to and during experience • Took feedback from parents to adjust instruction schedule • Established elementary instructional schedules • District facilitators created social studies and science lessons
Bailee	3rd	<ul style="list-style-type: none"> • Superintendent gave updates and messages of encouragement • Weekly meetings with principals • No curricular support or guidelines provided
Lauren	4th	<ul style="list-style-type: none"> • Superintendent proactive and supportive • Took feedback from parents to adjust instruction schedule • Established elementary instructional schedules • District facilitators created social studies and science lessons
Kelly	4th	<ul style="list-style-type: none"> • Interim superintendent was supportive and encouraging – sent emails each week, wrote and sang a song for them • Superintendent gave updates and messages of encouragement
Julie	5th	<ul style="list-style-type: none"> • Weekly meetings with principals • No curricular support or guidelines provided • District technology specialists had trainings and offered support
Daisy	5th	<ul style="list-style-type: none"> • Superintendent gave updates and messages of encouragement • Weekly meetings with principals • No curricular support or guidelines provided • District technology specialists had trainings and offered support
Elizabeth	5th	<ul style="list-style-type: none"> • Superintendent gave guidance and insight for flexibility they would need • Kept them updated with reports and decisions from state • District curriculum facilitator attended all content team meetings

Table 13: State Level Support Provided to Teachers during Remote Learning, Spring 2020

Subject	Grade Level	Support: State Level
Anne	K	<ul style="list-style-type: none"> • Cancelled state testing
Hannah	K	<ul style="list-style-type: none"> • Computer Science Specialists kept the CSTE teachers updated and shared resources • Cancelled state testing
Sherry	1st	<ul style="list-style-type: none"> • Cancelled state testing
Abby	2nd	<ul style="list-style-type: none"> • Cancelled state testing
Bailee	3rd	<ul style="list-style-type: none"> • Cancelled state testing • AMI lessons available thru PBS streaming (did not use)
Lauren	4th	<ul style="list-style-type: none"> • Cancelled state testing
Kelly	4th	<ul style="list-style-type: none"> • Cancelled state testing
Julie	5th	<ul style="list-style-type: none"> • Cancelled state testing • AMI lessons available thru PBS streaming (did not use)
Daisy	5th	<ul style="list-style-type: none"> • Cancelled state testing • Used AMI lessons available thru PBS streaming
Elizabeth	5th	<ul style="list-style-type: none"> • Cancelled state testing • AMI lessons available thru PBS streaming (did not use)

State Level Support (Table 13): All subjects reported that their state cancelled high stakes testing in the spring, which they saw as a form of support provided by the state. Bailee, Julie, Daisy, and Elizabeth shared that their state partnered with PBS streaming services to provide a

menu of services they could for remote learning, and Daisy is the only teacher that used these services. Hannah shared that her state Computer Science Specialists kept the teachers updated throughout the experience and shared resources they could use.

Issues and Personal Learning Experiences with Technology during Remote Learning

Technology played a key role in the online delivery methods of remote learning for each subject. Issues subjects faced with accessibility to technology are summarized in Table 14 and their struggles with technology are summarized in Table 15. Personal learning experiences with technology that subjects encountered during remote learning are summarized in Table 16.

Table 14: Factors with Accessibility to Technology during Remote Learning, Spring 2020

Subject	Grade Level	Accessibility to Technology
Anne	K	<ul style="list-style-type: none"> • District surveyed parents to determine device and internet needs • 1/16 without internet access • Checked out devices to students who needed
Hannah	K	<ul style="list-style-type: none"> • Students could check out Chromebooks if needed
Sherry	1st	<ul style="list-style-type: none"> • Students could check out Chromebooks if needed • 2/18 without internet access
Abby	2nd	<ul style="list-style-type: none"> • Chromebooks sent home with students prior to start
Bailee	3rd	<ul style="list-style-type: none"> • Surveyed parents to determine accessibility • Students could check out Chromebooks if needed • 3/20 without internet access
Lauren	4th	<ul style="list-style-type: none"> • Chromebooks sent home with students prior to start
Kelly	4th	<ul style="list-style-type: none"> • Students could check out laptops if needed • More rural area with unreliable internet
Julie	5th	<ul style="list-style-type: none"> • Students could check out Chromebooks if needed • All students had internet access
Daisy	5th	<ul style="list-style-type: none"> • Students could check out Chromebooks if needed • Survey of her students revealed most did not have internet at home, used free Wi-Fi services at restaurants or in school parking lot
Elizabeth	5th	<ul style="list-style-type: none"> • Students could check out devices if need • Rural area with unstable or no access to internet • Gave availability to mobile hotspots across district

Accessibility to Technology (Table 14): All subjects’ students were able to use a device provided by their school for remote learning. Abby and Lauren sent Chromebooks home with their students the weekend prior to the start of remote learning while the other subjects’ students

could check out a device from their school once remote learning began. Kelly and Elizabeth had the most issues with access to reliable internet due to their rural locations, and Daisy reported most of her students relied on free Wi-Fi services from restaurants or their school parking lot.

Table 15: Struggles with Technology during Remote Learning, Spring 2020

Subject	Grade Level	Struggles with Technology
Anne	K	<ul style="list-style-type: none"> • <i>Schoology</i> platform crashed week 2 • Learning curve with <i>Schoology</i>; students & parents had to learn • Lot of parent questions the first week of transition
Hannah	K	<ul style="list-style-type: none"> • Had to learn to use <i>Google Meet</i> rather than <i>Zoom</i> • Her team had not used technology with kids prior to remote learning so they struggled to implement
Sherry	1st	<ul style="list-style-type: none"> • Technical issues with hyperlinks in their choice boards each week • Hard to ‘teach to a screen – to yourself’
Abby	2nd	<ul style="list-style-type: none"> • Technical and troubleshooting issues each week with linked resources • District had to approve some sites they were using
Bailee	3rd	<ul style="list-style-type: none"> • Technical and troubleshooting issues in weeks 3 & 4 during transition to online method
Lauren	4th	<ul style="list-style-type: none"> • Local internet outage in week 5 slowed their work • Minor troubleshooting issues the first couple weeks
Kelly	4th	<ul style="list-style-type: none"> • District wanted them to do online delivery thru <i>Google Classroom</i>, but most students did not have reliable internet access • Unreliable personal hotspot and internet access – made working from home difficult • PDFs from curriculum resource were difficult for students to edit and submit properly • One student used school laptop for inappropriate purposes – had to remove from possession • She was using a school Chromebook and had multiple issues; eventually had to get a replacement
Julie	5th	<ul style="list-style-type: none"> • Her internet service was slow and often unreliable • Technical issues with hyperlinks in lessons due to district security settings • Sharing permissions in Google were a weekly source of frustration for her and team
Daisy	5th	<ul style="list-style-type: none"> • Lack of accessibility to internet meant students were turning in work at odd hours, when parents could take them to the parking lot • Technical issues with student access to YouTube – this was how they shared their recorded videos; district removed some privacy settings for approval
Elizabeth	5th	<ul style="list-style-type: none"> • Teammates were not comfortable using technology and she often carried the load • Many students were not able to access the internet, even with the mobile hotspots they made available • Three different storms caused multiple days of power outage in the area – delaying work

Technology Struggles (Table 15): All subjects reported similar struggles with basic technology troubleshooting in the first few weeks of their online experience. Anne’s struggles focused on parents learning their delivery platform, *Schoology*. Sherry, Abby, Julie, and Daisy reported struggles with hyperlinks to resources and district privacy settings that prohibited student use of websites. Each reported they were able to contact their technology department to get these settings changed for their use. Julie had issues with the permissions settings in *Google*, and Kelly had issues with students editing PDFs from their curricular resource. Lauren reported a

local internet outage slowed their progress in Week Five, and Elizabeth reported three different storm systems that caused multiple days of power outage for her students, delaying, and canceling some of their work and meetings during those weeks. Kelly and Julie had struggles with their internet at home and Julie had to have her school issued Chromebook replaced. Daisy reported that many of her students were accessing internet at local restaurants and in their school parking lot because they did not have access at home. Elizabeth struggled with teammates who were not as comfortable using the technology during remote learning and she often led their technology efforts. Kelly reported one instance of student misuse of technology and the school device was removed from that student's possession.

Personal Learning Experiences with Technology (Table 16): All subjects reported enhanced knowledge in specific technology platforms or new learning with instructional technology. Abby, Bailee, Lauren, Kelly, Daisy, and Elizabeth gained new insight and enhanced their knowledge and use of *Google Classroom*. Hannah, Sherry, Abby, Lauren, Julie, and Elizabeth learned to use programs to record their lessons and post for students to watch. Those programs included *Zoom*, *Screencastify*, and *Loom*. All the subjects used some videoconferencing tool, and many learned new features and settings to use in those videoconferences. *Google Meet* was new for Hannah, Abby, Bailee, and Elizabeth. *Zoom* was new for Sherry, Julie, and Daisy. Anne learned to use the videoconference tool embedded in *Schoology* and was the first kindergarten teacher in the district to host videoconferences with groups of students. Lauren learned to use *Edpuzzle* to create interactive video lessons with embedded formative assessment. Kelly, Julie, Daisy, and Elizabeth all learned how to give feedback and grade assignments online, finding it easier and more effective. They all intend to

utilize this feature in the classroom. Sherry, Bailee, Julie, and Daisy all learned how to use certain technology programs and features from their teammates during the experience.

Table 16: Personal Learning Experiences with Technology during Remote Learning, Spring 2020

Subject	Grade Level	Professional Growth Examples
Anne	K	<ul style="list-style-type: none"> • Taught herself how to use <i>Schoology</i> with kindergarteners • Used first few weeks with packets to practice using <i>Schoology</i> with students • First kindergarten teacher in district to use videoconference tool with students
Hannah	K	<ul style="list-style-type: none"> • Learned new features in <i>Nearpod</i> and <i>Google Meet</i> • Screencastify used to record lessons and read alouds
Sherry	1st	<ul style="list-style-type: none"> • Learned how to screen record and record lessons • Learned how to use <i>Zoom</i> videoconferencing from her teammates • Appreciated the opportunity to learn programs and resources they had heard about but hadn't used yet
Abby	2nd	<ul style="list-style-type: none"> • Had not used <i>Google Classroom</i> with students before – this was a learning area • Used Screencastify to provide new instruction
Bailee	3rd	<ul style="list-style-type: none"> • District provided Go Guardian to support working with students and their online safety • Team worked together and used one central <i>Google Classroom</i> • District purchased Screencastify so they could record new instruction
Lauren	4th	<ul style="list-style-type: none"> • Enhanced her skills with <i>Google Classroom</i> – learned new features, made it more efficient for students • Learned how to use Edpuzzle to make interactive lessons
Kelly	4th	<ul style="list-style-type: none"> • Enhanced her skills with <i>Google Classroom</i> • Liked grading assignments online
Julie	5th	<ul style="list-style-type: none"> • Watched and learned about the technology from teammates • Researched <i>Zoom</i> features and settings to become more adept • Taught herself to use Screencastify • Liked the ability to grade and give feedback online • New user with <i>Zoom</i> – eventually became a “<i>Zoom Rockstar</i>”
Daisy	5th	<ul style="list-style-type: none"> • Learned from her teammates and her students about the features in <i>Zoom</i> • Spent time learning a few select programs to develop confidence and comfort level • Liked giving feedback and grading online
Elizabeth	5th	<ul style="list-style-type: none"> • Enhanced her <i>Google Classroom</i> skills; learned to use it more effectively with students • Loved grading the writing assignments online – made process easier and more manageable • Learned to use Loom to screen record her lessons • Learned to use several extensions in Chromebook

Additional Influencing Factors during Remote Learning

Other factors influenced the remote learning experience for each subject. Table 17 provides a summary of each subject’s perceptions of their balance between work and home during the remote learning experience. Table 18 provides a summary of the additional factors, categorized by theme, that influenced their experiences.

Table 17: Balance with Work and Home Life during Remote Learning, Spring 2020

Subject	Grade Level	Balance: work/home
Anne	K	<ul style="list-style-type: none"> • Difficult to find a balance; often felt “chained to the electronics” • Felt as if she were on the clock 24/7 – computer is always there • Felt guilty taking time to herself; found ways to do get things at home done when should during the day • Tried to set boundaries: sign off at 4pm, sign off on weekends • Empty nester – just she and husband; couldn’t imagine ‘being a mom’ during all this too
Hannah	K	<ul style="list-style-type: none"> • Was not a struggle; enjoyed the flexibility of her daily schedule • Set work hours – parents knew her available hours and she would respond the next day if they messaged after hours
Sherry	1st	<ul style="list-style-type: none"> • Difficult to find a balance; felt on call 24 hours, 7 days a week • ‘Doing schoolwork from time I got up till the time I go to bed’ • Felt like she found her groove around week 3 – learned to manage time • Appreciated the flexibility to determine when she worked each day
Abby	2nd	<ul style="list-style-type: none"> • Was not a struggle; held her evenings and weekends for her time • Set work hours like those on normal school day • Single and lives alone – only must take care of herself • Did not like working from home – wanted the physical separation
Bailee	3rd	<ul style="list-style-type: none"> • Difficult to find a balance; was hard to be a parent to two little ones and teach at the same time • Hard to find or create boundaries; did bulk of her schoolwork in evenings when kids were in bed • Husband is firefighter and works odd shifts – she was often juggling kids, home life, and school without assistance • Accepted she could not work ‘normal school hours’ during the experience and that helped her manage better • Teammates did not have children, so they often took the day shifts and she worked in the evenings
Lauren	4th	<ul style="list-style-type: none"> • Was not a struggle; enjoyed the flexibility • Intentional about her schedule each day and about unplugging on the weekends • No kids, just her husband at home; enjoyed time with him • She knew her stress was less than teammates doing this with families
Kelly	4th	<ul style="list-style-type: none"> • Was not a struggle; enjoyed the flexibility working from home provided • Felt lower levels of stress during remote learning as they did not have all the requirements they would at school and state testing was cancelled
Julie	5th	<ul style="list-style-type: none"> • Was not a struggle; found ways to balance work and home life • Struggled with constant lure of the computer; hard to turn it off and walk away from it
Daisy	5th	<ul style="list-style-type: none"> • Was not a struggle; some tension at times when both she and husband were trying to do Zoom calls at the same time • Created a separate workspace in the basement • Realized she wasn’t a teacher from just 8-3, was a teacher all day and all night; had to set hours for responding to messages • Intentional about weekends being her time with family and for recharging
Elizabeth	5th	<ul style="list-style-type: none"> • Difficult to find a balance being a teacher and a mom to a 1st grader; husband was a teacher too – difficult to meet demands of their job and help son with his remote learning work • Appreciated the ‘mom perspective’ that her son’s experience gave; felt it gave her greater empathy for her students’ parents • Liked the flexibility in the schedules

Balance with Work and Home Life during Remote Learning (Table 17): Hannah, Abby, Lauren, Kelly, Julie, and Daisy all reported having a good balance with their work and home lives during the experience. Each of them had set hours they were available or working each day and communicated those with parents. They each enjoyed the flexibility of the remote learning schedule and were intentional with their evening and weekend times being devoted to their

families. Hannah and Kelly had older children at home while Abby, Lauren, and Daisy did not have any children at home. Abby did not like working from home, preferring the physical separation of school and home. Julie felt the constant lure of the computer and had to turn it off and walk away from it at times.

Alternatively, Anne, Sherry, Bailee, and Elizabeth all found it difficult to find a balance with their work and home lives. Anne is the only one of that group that did not have children at home during the experience. They reported feeling like they were on the computer 24 hours a day, seven days a week. They did not feel they could get away from the computer or the schoolwork. Anne felt guilty taking time off for herself and tried to set boundaries for shut-off times in the evening and on the weekends. Sherry felt like she found a groove around week three and learned to manage her time better. Bailee had two young children at home who demanded her attention during the day. She did her schoolwork in the evenings when her kids went to bed. Elizabeth also had a young child at home during the experience who had his own remote learning to complete. She found it difficult to meet the demands of her job while also attending to her son's needs and remote learning requirements.

Other Factors that Impacted the Remote Learning Experience (Table 18): Additional factors that influenced the subjects' experiences can be categorized into six sections: expectations, student welfare, inadequacy, academic concerns and inequities, student motivation, and outliers. Table 18 presents these themes, the subjects who experienced them, and descriptions of the factors given by the subjects.

Table 18: Other Factors that Impacted the Remote Learning Experience, Spring 2020

Factor	Subjects Experiencing the Factor	Descriptions
Expectations	Anne Hannah Sherry Kelly	<ul style="list-style-type: none"> • Nothing was consistent; struggled to create a routine with all the changes • Changes to the delivery method caused her extreme stress and frustration • Lack of expectations or district guidance • Continually changing expectations and changes were shared with parents at the same time they were shared with teachers • Unclear expectations and not knowing what remote learning should look like caused frustration; things were constantly changing
Student Welfare	Anne Lauren	<ul style="list-style-type: none"> • Concerns about the welfare of her students; how are they doing; do they have food; lack of routine and structure • Students with active CPS cases – was concerned about their wellbeing
Inadequacy	Anne Hannah Bailee Julie Daisy	<ul style="list-style-type: none"> • Struggled with feeling inadequate and did not think she was doing enough for her students • Did not feel she was ‘doing her job’ or doing enough for the kids • Social media posts would lead to comparison of what she was doing, and she would feel inadequate • Struggle with lack of ‘tech-savviness’ • Did not feel like she was teaching or doing enough: ‘I don’t feel like a teacher. I feel like an aid who’s passing out work.’
Academic Concerns & Inequity	Hannah Abby Lauren Kelly Julie Elizabeth	<ul style="list-style-type: none"> • Concerned about the learning experiences students were missing • Did not think she was teaching anything because she couldn’t teach anything new • Difficult to know how much of the work was done by the student and what level of assistance was given to them with the work • Concerns about differentiation and how her inclusions students would manage having to use the same approach as the other students; collaborated with inclusion support teacher to ensure they were targeting IEP goals • Inequity among the teachers at her school with instructional delivery and across district with variation of activities presented • Equity issues: accessibility to internet; paper packets vs. online work; academic equity; accountability
Student Motivation	Bailee Kelly Daisy	<ul style="list-style-type: none"> • Students did not always have ‘grit’ or motivation to do their work • No way to hold students accountable for their learning; students became lazy and complacent without accountability
Outlier – 1 st Year Struggles	Abby	<ul style="list-style-type: none"> • First-year teacher and was still trying to figure out how to teach in-person in the classroom – then trying to reconfigure how to teach to a virtual classroom • Difficult to move forward with new standards in 4th quarter that she had not taught in-person and did not know very well
Outlier	Julie	<ul style="list-style-type: none"> • Because of school’s population, felt pressure to ‘deliver a better digital product’ and felt pressure to give feedback on every assignment

Half of the subjects expressed feelings of inadequacy and did not feel they were doing enough for their students during the remote learning experience. Six of the subjects expressed concerns about the equity of the academic learning experiences of their students and discussed inequities that they perceived during the remote learning experience. Four of the subjects noted the lack of expectations and consistency throughout the experience as a hindrance during the remote learning experience. Three subjects expressed struggles with student motivation and noted a lack of accountability measures for student learning and participation. Abby was a first-

year teacher and expressed struggles related to teaching in her first year, as well as trying to shift instruction to remote learning. Julie perceived higher expectations from her parents and felt a pressure to deliver a “better product” than what she could deliver at the time.

Reflections on the Remote Learning Experience

As subjects reflected on the remote learning experience, they were asked about the highlights of the experience and their obstacles during the experience. They were also asked to share how prepared they felt to administer instruction through remote learning. Table 19 summarizes the reflections of their highlights of the remote learning experience and Table 20 summarizes their reflections of the obstacles during the remote learning experience. Table 21 summarizes their perceptions of preparedness for remote learning.

Highlights of the Remote Learning Experience (Table 19): Seeing the students on their videoconference calls and getting to know them on a different level was a highlight of the experience for six subjects. Hannah, Sherry, Abby, Bailee, Julie, and Daisy all enjoying getting to know more about their students, their home environments, and see their unique personalities come alive each time they met on videoconferences. Hannah loved the excitement of her students on Science Wednesdays, and Daisy loved that her fifth graders still enjoyed a read-aloud even in the remote setting. Julie noted she was able to make deeper connections with some of her students that she would not have made in the classroom. Quieter students found their voice in the virtual setting, and students opened-up, shared their feelings and emotions, and displayed different personality traits while interacting from the comfort of home. Lauren enjoyed seeing some of her students thrive with this instructional delivery model and saw possibilities for personalized and differentiated learning in the classroom. Lauren also appreciated the dedicated

time she was able to spend with some of her struggling learners, knowing this would not have happened in the classroom.

For Anne, the highlights involved seeing her students and their parents develop stronger interactions through their participation in the activities she shared designed to involve the family in at-home learning. Elizabeth appreciated the support from colleagues, seeing teachers from across the state and country come together to support each other. For Kelly, the highlight was having the flexibility to set her own working hours and spend more time with her family.

Table 19: Reflections on the Highlights of the Remote Learning Experience, Spring 2020

Subject	Grade Level	Highlights
Anne	K	<ul style="list-style-type: none"> • Seeing the parents develop stronger interactions with their child • Creating home-school learning connections with parents
Hannah	K	<ul style="list-style-type: none"> • Seeing her students in the <i>Google Meets</i> each day – loved the ‘chaos’ of kindergarten • Doing the science experiments on Wednesdays and seeing their excitement
Sherry	1st	<ul style="list-style-type: none"> • Getting an inside look at her students’ lives, their home life, and the part it plays in their success.
Abby	2nd	<ul style="list-style-type: none"> • Seeing the students each time in their <i>Google Meets</i>. Loved the connections they made.
Bailee	3rd	<ul style="list-style-type: none"> • Getting to know more about the kids and their home environments through their <i>Google Meets</i>. • Seeing who had the power to persevere and ‘show grit’ vs those who don’t care
Lauren	4th	<ul style="list-style-type: none"> • Seeing how some of students thrived with this model of learning. Saw possibilities for personalized learning options • Being able to spend more 1:1 time and small group time with some of her struggling learners
Kelly	4th	<ul style="list-style-type: none"> • Having the flexibility to set her own working hours and be with her family more.
Julie	5th	<ul style="list-style-type: none"> • Making deeper connections with several of her students that she would not have made in the classroom. • Seeing a different side of her students in their <i>Zoom</i> meetings. • Learning more technology.
Daisy	5th	<ul style="list-style-type: none"> • Seeing the students on <i>Zoom</i> and watching their personalities come through in the meetings. • Appreciated their excitement about reading in <i>Zoom</i> calls.
Elizabeth	5th	<ul style="list-style-type: none"> • Seeing how teachers came together to support each other. • Appreciated the online communities that formed across the state and country.

Obstacles during the Remote Learning Experience (Table 20): Subjects shared obstacles in their experiences (Table 20), which often mirrored the influencing factors discussed earlier. The lack of consistency with expectations and the constantly changing state of things was an obstacle for Hannah and Daisy. Technology issues, troubleshooting these issues, and the need to learning new digital tools and platforms was an obstacle for Sherry, Kelly, Julie, and Elizabeth. Trying to digitize curricular resources was another obstacle for Kelly and Julie. Not being able to reach parents or contact certain students throughout the experience was an obstacle for Bailee,

Lauren, and Kelly. A lack of accountability for student work and not knowing exactly who was doing the work that was submitted was an obstacle for Abby, Lauren, and Daisy. Concerns over student well-being and not knowing how their students were doing creating anxiety and obstacles for Anne and Bailee. Feelings of inadequacy created obstacles for Anne. Managing the experience as a teacher and a mom was an obstacle for Elizabeth. Julie found obstacles with not having the physical books in her students’ hands and trying to recreate the collaborative nature of learning in a virtual environment.

Table 20: Reflections on the Obstacles to the Remote Learning, Spring 2020

Subject	Grade Level	Obstacles
Anne	K	<ul style="list-style-type: none"> • Feelings of inadequacy and not doing enough for her students • Not knowing if they were okay or not created anxiety
Hannah	K	<ul style="list-style-type: none"> • Administrative decisions in mid-stream • Lack of consistency with expectations – constantly changing • Lack of technology integration by other teachers in school
Sherry	1st	<ul style="list-style-type: none"> • Learning and using all the technology resources. • Student completion of work – no accountability
Abby	2nd	<ul style="list-style-type: none"> • Never knew who was doing the work; quality of work was not like the classroom • Students and parents did not understand seriousness of the remote learning.
Bailee	3rd	<ul style="list-style-type: none"> • Not being able to reach all the parents – couldn’t contact some parents; not all had access to technology or internet • Not knowing how students were doing at home and if they were okay or not
Lauren	4th	<ul style="list-style-type: none"> • Not being able to reach all the parents and students • Not much they could do if a student did not complete work or participate in calls
Kelly	4th	<ul style="list-style-type: none"> • Trying to work with technology and utilize curriculum materials appropriately online • Not being able to contact some students and parents
Julie	5th	<ul style="list-style-type: none"> • Technology issues each week • Implementing all the elements of curriculum online – not easily digitized • Not having books in students’ hands – hard to teach reading • Recreating the collaborative nature of learning virtually
Daisy	5th	<ul style="list-style-type: none"> • Engaging students in <i>Zoom</i> meetings. • Having to ‘chase students down’ to get work submitted. • Lack of guidance and expectations from district – it was constantly changing.
Elizabeth	5th	<ul style="list-style-type: none"> • Managing as a teacher and parent; boundaries with home/work time. • Troubleshooting and explaining technology to parents over email

Reflections on Perceptions of Preparedness (Table 21): Hannah, Lauren, and Julie felt they were prepared for the remote learning situation. Hannah believes she was prepared because she actively attends technology training and implements in her classroom. Lauren believed her district did a good job in preparing them for the possibility of remote learning. Julie believed she was as prepared as she could be for this type of situation. Anne, Sherry, and Bailee did not feel

prepared for the remote learning situation. Anne was not prepared to use the district delivery platform and had to learn it as they went. Sherry was not prepared for the shift in delivering instruction, and Bailee had not had training in using technology for this purpose. Abby, Kelly, Daisy, and Elizabeth answered the question both ways. Abby felt prepared mentally but was not prepared to deliver instruction online. Kelly felt prepared to use the technology but was not prepared in knowing what students should be doing or how to administer grades during remote learning. Daisy felt she was prepared and did the best she could do, but she was not prepared in knowing expectations and did not understand why new instruction could not occur. Elizabeth felt she was prepared because she had taken initiative to learn and implement technology in the classroom, but she did not feel prepared because they did not have expectations or accountability measures in place. All four of the subjects who answered with both were unprepared due to a lack of set expectations and guidelines for accountability during the experience.

Table 21: Reflections on their Perceptions of Preparedness for Remote Learning, Spring 2020

Subject	Grade Level	Preparedness
Anne	K	<ul style="list-style-type: none"> • Did not feel prepared and had to learn to use <i>Schoology</i> while doing it. • Did not like the feeling of everything being digitized.
Hannah	K	<ul style="list-style-type: none"> • Felt prepared because she actively attends technology training and implements in her classroom. • Her students were prepared because they had used the platforms in class.
Sherry	1st	<ul style="list-style-type: none"> • Did not feel prepared and had to do a 180 shift in how we deliver instruction.
Abby	2nd	<ul style="list-style-type: none"> • Felt mentally prepared because she had been exposed to the possibility. • Did not feel prepared to do the instruction online; no clear instructional plan going into it.
Bailee	3rd	<ul style="list-style-type: none"> • Did not feel prepared - had not had training in the use of technology for this purpose.
Lauren	4th	<ul style="list-style-type: none"> • Felt prepared and thought the district did a good job preparing them for the possibility. • Appreciated the clear expectations for their schedules and assignments.
Kelly	4th	<ul style="list-style-type: none"> • Felt somewhat prepared with the technology but learned about more tools she did not know. • Did not feel prepared in understanding expectations of what students should be doing or how to administer grades.
Julie	5th	<ul style="list-style-type: none"> • Felt she was as prepared as she could be for this type of situation.
Daisy	5th	<ul style="list-style-type: none"> • Felt somewhat prepared and did the best she could with what she knew how to do. • Did not feel prepared with a lack of expectations and struggled to accept why they couldn't deliver new instruction.
Elizabeth	5th	<ul style="list-style-type: none"> • Felt she was prepared because she had taken initiative to learn and try new things in the classroom. • Did not feel prepared due to lack of expectations and accountability.

Suggestions to Better Prepare for Similar Situations

Subjects were asked to share how teachers, students, and parents could be better prepared for similar situations of remote learning in the future. Table 22 provides a summary of the subjects' suggestions to better prepare teachers for similar situations. Table 23 provides a summary of their suggestions on better preparing students, and Table 24 provides a summary of their suggestions to better prepare parents for similar situations in the future.

Table 22: Summary of Suggestions to Better Prepare Teachers for Similar Situations

Subject	Grade Level	Teachers
Anne	K	<ul style="list-style-type: none"> • Need clear expectations, rules, boundaries that are set before the situation • Record classroom routines for structure in virtual setting
Hannah	K	<ul style="list-style-type: none"> • Required training in digital learning platforms and require evidence of implementation in classroom after training.
Sherry	1st	<ul style="list-style-type: none"> • Offer more technology training on different platforms and programs. • Learn from other's experiences; find out what worked/what did not work • Gather feedback from parents and adjust. • Establish common practices for all grade levels.
Abby	2nd	<ul style="list-style-type: none"> • Establish a central location for teacher resources like websites, links to virtual manipulatives, videos, etc. • Set universal communication requirements – use the same method and same amount of communication
Bailee	3rd	<ul style="list-style-type: none"> • Offer training on Google platform products. • Set expectations up front – know what we need to do before we do it • Set consistent expectations and guidelines across the district
Lauren	4th	<ul style="list-style-type: none"> • Provide more experience and practice with technology programs • Empower teachers to use the <i>Google Classroom</i> platform • Clear expectations from a 'higher power' to be successful
Kelly	4th	<ul style="list-style-type: none"> • Provide training in Google Suite applications they are expected to use • Set expectations and systems up front, not during the experience • Hold virtual staff meetings to keep everyone updated and consistent
Julie	5th	<ul style="list-style-type: none"> • Ensure they have reliable technology. • Establish consistent methods of communication to parents. • Provide training with various technology resources – what and how to use it
Daisy	5th	<ul style="list-style-type: none"> • Establish district-wide expectations with set boundaries for everyone. • Set accountability measures and expectations • Provide training in technology platforms and programs we're expected to use. • Develop consistent methods of communication for all
Elizabeth	5th	<ul style="list-style-type: none"> • Provide differentiated levels of technology training and implement in classroom • Ensure teachers have reliable technology • Establish accountability expectations

Better Prepare Teachers for Similar Situations (Table 22): Seven subjects suggested establishing clear expectations and accountability measures before going into another situation. These expectations should be district-wide and set clear boundaries for everyone. Eight subjects suggested offering technology training in the various platforms and programs teachers would

need to use in this situation. They offered ideas for differentiated training and expressed the need for teachers to implement the training in their classrooms. Three subjects suggested developing a consistent method for parent communication and establishing expectations for parent communication in this situation. Two subjects suggested ensuring teachers are provided with appropriate and reliable technology to do their jobs in this situation.

Table 23: Summary of Suggestions to Better Prepare Students for Similar Situations

Subject	Grade Level	Students
Anne	K	<ul style="list-style-type: none"> • Get them on <i>Schoology</i> earlier in the year; use it in the classroom like for a reading log • Resources ready ahead of time – know their login and passwords for their programs
Hannah	K	<ul style="list-style-type: none"> • Teach students how to use the devices and programs. Give expectations with these programs. • Students should be on the technology earlier and more consistently throughout the year.
Sherry	1st	<ul style="list-style-type: none"> • Roll out different ways of learning at the beginning of the year. Get students on devices and programs earlier. • Provide more social-emotional learning.
Abby	2nd	<ul style="list-style-type: none"> • Teach students how to use the devices and programs earlier in the year. • Create equitable accountability expectations for student work and attendance.
Bailee	3rd	<ul style="list-style-type: none"> • Start students on computers earlier so they are comfortable logging in and navigating • Teach work habits and independent work skills • Teach digital citizenship and online safety and etiquette.
Lauren	4th	<ul style="list-style-type: none"> • Host a digital 'walk in my shoes' night teaching them to interact with the digital platforms and programs • Establish expectations on use of technology, email, assignments and help them feel confident in their ability to do digital learning
Kelly	4th	<ul style="list-style-type: none"> • Teach study skills and have students practice these to encourage better motivation
Julie	5th	<ul style="list-style-type: none"> • Implement technology with students earlier and more consistently throughout the year • Prepare students in classroom with expectations for learning and participation online.
Daisy	5th	<ul style="list-style-type: none"> • Teach students how to use the programs and submit work. • Teach digital citizenship and online safety and etiquette. • Provide time-management training and support them in setting routines and schedules at home.
Elizabeth	5th	<ul style="list-style-type: none"> • Teach technology tools in the classroom starting day one • Ensure students understand accountability expectations

Better Prepare Students for Similar Situations (Table 23): The most prominent suggestion for preparing students was to implement technology in the classroom earlier and teach students how to login, navigate, and access their learning, as well as knowing what is expected of them when using technology. Eight subjects made this suggestion. Five subjects suggested establishing accountability expectations for submission of work and participation during online learning and ensure that students understand these expectations. Two subjects suggested teaching digital citizenship and online etiquette, and two subject suggested teaching

study skills, work habits, and time management strategies for more effective independent and motivated learning.

Better Prepare Parents for Similar Situations (Table 24): The most common suggestion for preparing parents, made by seven subjects, was to have parent training, or parent nights, where parents are taught how to use and interact with the digital platforms and programs the students are using so they can support them at home. Four subjects also suggested making sure parents were aware of the seriousness and legitimacy of remote learning and that they know the expectations for students during this type of situation. Four subjects suggested having a common method of communication and ensure all parent have access to the appropriate method of communication and understand the communication expectations.

Table 24: Summary of Suggestions to Better Prepare Parents for Similar Situations

Subject	Grade Level	Parents
Anne	K	<ul style="list-style-type: none"> Stock up on school supplies when they are cheaper in August Have training during registration for school; get them all in the system and connected
Hannah	K	<ul style="list-style-type: none"> Provide support with use of the technology and help dispel the fears surrounding it. Host parent night training and demonstrate use of technology, set expectations, and give guidance for type of support needed at home
Sherry	1st	<ul style="list-style-type: none"> Get parents enrolled in all the programs at the beginning of the year. Have a central location for all logins, passwords, and resource websites for parents to access readily.
Abby	2nd	<ul style="list-style-type: none"> Communicate the seriousness and legitimacy of digital learning. Set universal communication requirements – use the same method and same amount of communication
Bailee	3rd	<ul style="list-style-type: none"> Teach digital citizenship and online safety and etiquette. Host classes for parents to learn how to use computers and the programs students use
Lauren	4th	<ul style="list-style-type: none"> Host a digital ‘walk in my shoes’ night teaching them to interact with the digital platforms and programs Provide learning targets ahead of time; give both written and video messages to support with what their child should be doing
Kelly	4th	<ul style="list-style-type: none"> Use a school-wide system of communication and set expectations for communication with parents Ensure parents have access to the communication method and can use it Help parents understand teachers have an ‘open-door’ policy to help support their child
Julie	5th	<ul style="list-style-type: none"> Ensure parents know how to be part of the communication loop Ensure they know expectations of students Host ‘back to school’ night with technology training embedded
Daisy	5th	<ul style="list-style-type: none"> Ensure parents understand importance of online learning and expectations for students in this situation. Provide training on how to support their child in at-home learning situations. Ensure parents know the communication method and expectations
Elizabeth	5th	<ul style="list-style-type: none"> Host parent meetings to demonstrate and experience technology Ensure understanding of expectations and use of technology Provide technology and internet access to those in need Gather feedback regarding ‘best times’ to work at home for scheduling live meetings

Perceptions of Effectiveness of the Remote Learning Experience in Spring 2020

Subjects were asked if they thought the remote learning experience in Spring 2020 was effective. Table 25 summarizes their perceptions of the effectiveness of this experience.

Table 25: Perceptions of Effectiveness of Remote Learning in Spring 2020

Subject	Grade Level	Perceptions of Effectiveness of Remote Learning Experience
Anne	K	<ul style="list-style-type: none"> • Did not think it was effective for her students. Believes there will be a backslide in social and interpersonal skills due to loss of structure and routine. • Believes it was effective for the parents, helping develop stronger relationships with their children. • Believes it will help teachers get back to the basics of what is important – get rid of the fluff. • Helped them refocus in curricular areas and make changes after seeing the needs arise during remote learning.
Hannah	K	<ul style="list-style-type: none"> • Doesn't think she's taught them much, especially with the menu structure, as it was busy work. • Concerned students will be more behind than they already were.
Sherry	1st	<ul style="list-style-type: none"> • Believes it was effective for those kids with parents who could help them or who still had jobs during this time – those families who will do anything to help their child succeed. • Did not believe it was effective for those students who were already struggling or who did not have support at home during the experience.
Abby	2nd	<ul style="list-style-type: none"> • Did not believe it was effective. There was no accountability. Parents and students did not see the seriousness and legitimacy of the digital learning. Some kids did everything assigned, while others did little or nothing. There were no consequences for 'not going to school' each day.
Bailee	3rd	<ul style="list-style-type: none"> • Believes it was effective as a review and practice for those students who participated, but there was no new learning. • Did not believe it was effective because they could not provide the same level of support and students did not always receive support at home.
Lauren	4th	<ul style="list-style-type: none"> • Believed the effectiveness significantly varied student by student. If they are responsible and independent to start with, they will do well. Other students' success will greatly depend on the amount of support, or lack thereof, they receive at home.
Kelly	4th	<ul style="list-style-type: none"> • Did not believe it is effective. There is no motivation for students to do the work and no accountability. The kids did not get what they needed, and we had to dumb down assignments to reduce the workload and support parents.
Julie	5th	<ul style="list-style-type: none"> • Did not think we will know effectiveness for several years. Not sure she believes the experience was 'worth it' yet. • Concerned about the cost to the students and where they will be mentally and emotionally after this experience.
Daisy	5th	<ul style="list-style-type: none"> • Believes the experience was probably effective for those students who were self-starters and motivated to do their work. • Did not think it was effective for most of her students, as they were not motivated to do the work or participate.
Elizabeth	5th	<ul style="list-style-type: none"> • Did not believe it was as effective as leaders expected it to be. The kids who did well in class continued to do well in remote learning while those that struggled in the classroom continued to struggle during remote learning.

None of the subjects believed this experience was effective for most of their students. Four of those subjects thought it was probably effective for their students who were motivated, self-starters, or who had appropriate assistance at home during the experience. They believed the students who were already making progress or at mastery level continued to make progress or remain at their level during the experience. However, they believed that the students who were

struggling in the classroom continued to struggle during remote learning and it was not effective for them. Julie was not sure the experience was ‘even worth it’ and was concerned about students’ mental and emotional state after the experience. Anne believed the experience was effective for parents in helping them develop stronger relationships with their child and believes teachers will learn what is important and get rid of the ‘fluff’ because of the experience.

Transitioning Back to School in the Fall 2020

Nine of the ten subjects participated in a follow-up interview held in September where they shared their experiences transitioning back to school after remote learning. Lauren did not participate as her roles and responsibilities changed with her new position as an assistant principal in a different elementary school. Table 26 provides a summary of their experiences with the physical environment as they transitioned to onsite learning in the fall. Table 27 provides a summary of their experiences with instruction and Table 28 provides a summary of their experiences with technology integration in the fall. Table 29 provides a summary of other factors they experienced during the transition back to school in the fall.

Hannah was the only teacher not teaching onsite but who continued to deliver instruction through her district’s virtual learning school. Kelly and Elizabeth were teaching in both settings, having three onsite rotations and one virtual rotation each day. Kelly moved during the summer, changing district and grade level, teaching third grade Science. Bailee remained at the same school but moved from third grade to second grade.

Experiences with Changes in the Physical Environment (Table 26): All the subjects teaching onsite had to reconfigure their classroom arrangements to allow for social distancing requirements, placing their desks in rows, with little room to move around. Safety restrictions

also limit the amount of partner and group work that can be done in the classroom. Anne, Bailee, Julie, Daisy, and Elizabeth all discussed the strict schedules they must keep and the procedures they must follow due to safety restrictions. Anne, Sherry, Julie, Daisy, and Elizabeth all shared they were in the classroom for long periods of time with their students and very few breaks or time away from them.

Table 26: Summary of Experiences with Changes in the Physical Environment, Fall 2020

Subject	Grade Level	Physical Environment
Anne	K	<ul style="list-style-type: none"> • In the classroom for long periods of time • Cleaning their classrooms at least twice a day • Lot of rules and procedures for safety restrictions and sharing of materials or working in pairs • Noticed big gaps with students' ability to socialize
Hannah	K	<ul style="list-style-type: none"> • Teaching in Virtual Learning School • Meets with students in live meetings twice a week for phonics and mathematics
Sherry	1st	<ul style="list-style-type: none"> • Classroom reconfigured to social distance: desks in rows - made desks look like jeeps. • Struggling to keep them engaged in the spread-out rows. • Students are with her 'all the live-long day' • Virtual staff meetings
Abby	2nd	<ul style="list-style-type: none"> • Classroom reconfigured to social distance: desks in rows spaced apart – leaves little room to move around room
Bailee	3rd	<ul style="list-style-type: none"> • Blended type environment, integrating instruction with technology alongside typical classroom instruction • Lot of procedures and strict schedules • Classroom reconfigured to social distance: desks in rows
Kelly	4th	<ul style="list-style-type: none"> • Classroom reconfigured to social distance but still allows for small groups to work together safely
Julie	5th	<ul style="list-style-type: none"> • Classroom reconfigured to social distance – desks in rows • Lot of procedures and strict schedules • Long periods of time in the classroom with students • Limited with partner and group work structures
Daisy	5th	<ul style="list-style-type: none"> • Classroom reconfigured to social distance – desks in rows • Lot of procedures and strict schedules • Long periods of time in the classroom with students • Limited with partner and group work structures
Elizabeth	5th	<ul style="list-style-type: none"> • Classroom reconfigured to social distance – desks in rows • Lot of procedures and strict schedules • Long periods of time in the classroom with students • Limited with partner and group work structures

Experiences with Instruction (Table 27): Four subjects, Abby, Bailee, Julie, and Daisy, reported that literacy and mathematics are to be the focus of their instruction this year, working to decrease gaps in learning caused by the remote learning experience. Elizabeth and Kelly are departmentalized, and all their students receive daily instruction in each core subject (reading, writing, mathematics, and science). Anne's district designed lessons that can be used in both

onsite and virtual instruction, having plans for the first two quarters ready and housed in *Schoology* for all teachers to access. Hannah, Bailee, Julie, and Daisy are implementing a new mathematics curriculum and a new digital component for their literacy curriculum, and Abby is implementing a new literacy curriculum with science and social studies embedded. Hannah is delivering instruction virtually using recordings, live meetings, and various online tools.

Table 27: Summary of Experiences with Instruction, Fall 2020

Subject	Grade Level	Instruction
Anne	K	<ul style="list-style-type: none"> District planning time to plan for 1st and 2nd quarter Lessons designed with options for onsite and virtual Extended school day by 20 minutes District-wide schedules for instruction in each grade level
Hannah	K	<ul style="list-style-type: none"> Feels like she is 'teaching again' Virtual lessons delivered with recordings, live meetings, and online tools Implementing new mathematics curriculum; narrating/recording Science and social studies lessons presented alternating weeks
Sherry	1st	<ul style="list-style-type: none"> Can't do carpet time, partner work, group work, or share supplies. Reworking their typical plans and lessons to accommodate the safety restrictions
Abby	2nd	<ul style="list-style-type: none"> Several issues with student attention spans. Implementing new literacy curriculum, written by district
Bailee	3rd	<ul style="list-style-type: none"> Instructional focus is literacy and mathematics Lot of interruptions to the instructional schedule Limited with partner or group work Implementation of new mathematics curriculum; scripted
Kelly	4th	<ul style="list-style-type: none"> Departmentalized and teaches 4 rotations of science Teaching science – they can do some group work with strict protocols
Julie	5th	<ul style="list-style-type: none"> Student materials are all accessible; ready to go with them if they pivot Instructional focus is literacy and mathematics Implementing new mathematics curriculum
Daisy	5th	<ul style="list-style-type: none"> Instructional focus is literacy and mathematics Implementing new mathematics curriculum; scripted New digital component with literacy curriculum Limited with partner and group work
Elizabeth	5th	<ul style="list-style-type: none"> Departmentalized and teaches 3 rotations onsite and 1 rotation virtually Certain lessons and activities are harder to do virtually

Experiences with Technology Integration (Table 28): All subjects reported their students were on the computers and using district selected platforms and programs. Hannah, Abby, Bailee, Kelly, Julie, Daisy, and Elizabeth are using *Google Classroom*. Elizabeth and Abby are also learning and implementing a new learning management system, *Seesaw*. Students are being prepared in all onsite classrooms for the possibility of pivoting to remote learning methods. Julie

said her district had given all their teachers Dell laptops and they are expected to take them home each night in case remote learning should occur.

Table 28: Summary of Experiences with Technology Integration, Fall 2020

Subject	Grade Level	Technology Integration
Anne	K	<ul style="list-style-type: none"> Using <i>Schoology</i> as consistent district platform: houses curriculum resources, lesson plans, parent & student communications
Hannah	K	<ul style="list-style-type: none"> District using <i>Google Classroom</i> as consistent platform Increased confidence in her abilities with technology and the virtual learning environment
Sherry	1st	<ul style="list-style-type: none"> Started students on Chromebooks day one. Told to be sure students knew how to log in and access everything in case they must go remote.
Abby	2nd	<ul style="list-style-type: none"> District uses <i>Google Classroom</i> and added <i>Seesaw</i> as instructional delivery platforms. Students utilizing both programs; required to take Chromebook back and forth each day/night
Bailee	3rd	<ul style="list-style-type: none"> District uses <i>Google Classroom</i> as consistent platform Students have specific lessons each day that are online and independent. Increased confidence in her abilities with technology integration
Kelly	4th	<ul style="list-style-type: none"> District uses <i>Google Classroom</i> for delivery platform Teaches one section live streamed to the virtual learners Aide travels through the rotations to film the lessons
Julie	5th	<ul style="list-style-type: none"> District uses <i>Google Classroom</i> for delivery platform Teachers were given Dell laptops and expected to take home every night if they pivot District uses <i>Google Classroom</i> for delivery platform
Daisy	5th	<ul style="list-style-type: none"> Must be ready to pivot to remote learning Started in <i>Google Classroom</i> day one, use Chromebooks several times a day Don't have enough Wi-Fi access points; frequently disconnected
Elizabeth	5th	<ul style="list-style-type: none"> District purchased <i>Seesaw</i> for instructional platform but also uses <i>Google Classroom</i>. District purchased Go Guardian to help manage devices and online safety. Using digital learning in classroom and trying to mirror onsite and virtual instruction

Other Factors Experienced during the Transition Back to School (Table 29): All subjects reported onsite and virtual options being offered by their district, with more rigorous learning expectations than were present in the spring. Seven of the subjects' districts have dedicated virtual learning teachers, while Kelly and Elizabeth provide both the onsite and virtual instruction. Many of them shared how exhausting the experience has been because they are doing their typical duties while also adhering to safety restrictions, cleaning their rooms, and spending more time with their students during the day than normal.

Table 29: Summary of Other Factors Experienced in the Transition Back to School, Fall 2020

Subject	Grade Level	Other
Anne	K	<ul style="list-style-type: none"> Onsite and virtual options: dedicated virtual teachers Virtual learning is more rigorous than spring and mirrors the onsite classroom Exhausting; still doing typical duties and responsibilities but little down time without the kids

Table 29 (Cont.)

Subject	Grade Level	Other
Hannah	K	<ul style="list-style-type: none"> Onsite and virtual options: dedicated virtual teachers Virtual learning is more rigorous than spring and follows same pacing and curriculum as classroom Students not required to attend live meetings or submit specific work
Sherry	1st	<ul style="list-style-type: none"> Onsite and virtual options: dedicated virtual teachers Virtual learning is more rigorous than spring. Students required to attend 4 live calls and complete the work and submit via <i>Google Classroom</i>. Exhausting; sheer exhaustion
Abby	2nd	<ul style="list-style-type: none"> Onsite and virtual options: dedicated virtual teachers Virtual learning is more rigorous than spring.
Bailee	3rd	<ul style="list-style-type: none"> Moved down to 2nd grade Onsite and virtual options: dedicated virtual teachers Virtual learning is more rigorous than spring. Doesn't feel like she is really teaching; feels more like a tech-facilitator; has two scripted curriculums Moved districts and teaching 3rd grade
Kelly	4th	<ul style="list-style-type: none"> Onsite and virtual options - teaches both Virtual option is more rigorous than spring. Required to attend 4 live meetings each day and submit their work consistently
Julie	5th	<ul style="list-style-type: none"> Onsite and virtual options: dedicated virtual teachers Virtual learning is more rigorous than spring. Word of the year – PIVOT School-wide communication tool with parents
Daisy	5th	<ul style="list-style-type: none"> Onsite and virtual options: dedicated virtual teachers Virtual learning is more rigorous than spring. New principal at building with new processes Doesn't feel like she's teaching since main curriculum is scripted
Elizabeth	5th	<ul style="list-style-type: none"> Onsite and virtual options - teaches both Virtual option is more rigorous than spring.

Perceptions of Future Implications from the Experience

As a final reflection, subjects were asked what how they thought this experience will influence them in the future and the future of education. Table 30 provides a summary of their perceptions of implications from the experience.

Table 30: *Perceptions of Future Implications from this Experience - Fall 2020*

Subject	Grade Level	Perceptions of Implications from the Experience
Anne	K	<ul style="list-style-type: none"> Provided parents a different perspective on homeschooling and virtual learning options. Seeing parents remove kids from public schools to enroll in online charter schools or homeschool them. Loss of traditional school activities; lost the presence of volunteers in their school this year because of safety restrictions; lost ability to do fundraisers, so where will additional money come from; loss of school traditions like band competitions, sports activities, programs, etc. Believes it will be the catalyst for a lot of teacher burnout and teachers leaving the profession, leading to a teacher shortage.
Hannah	K	<ul style="list-style-type: none"> Believes it's been a long time coming and wonders why we haven't considered it until now. Believes the virtual option gives students who don't thrive in the traditional school setting a chance to thrive and succeed. Hopeful that virtual learning options will continue to be offered.

Table 30 (Cont.)

Subject	Grade Level	Perceptions of Implications from the Experience
Sherry	1st	<ul style="list-style-type: none"> Doesn't think education will ever look the same again. Rethinking everything they've done in the past. Snow days will be a thing of the past because they can go virtual. Hopeful the experience gives parents a new perspective and provide a deeper level of respect for teachers.
Abby	2nd	<ul style="list-style-type: none"> Believes it will positively impact education with the incorporation of more digital learning, preparing them for the society in which they live. Thinks it will take time for teachers to figure out what they are doing digitally and what is truly worth incorporating in the classroom. Curious to know if the experience will change family's perspectives of onsite learning.
Bailee	3rd	<ul style="list-style-type: none"> Believes we will see more blended models of instruction utilized in schools. She expects to see students on the computer more often and with more independent learning activities. Concerned about students falling through the cracks because there is so much going on at one time; won't be able to pinpoint the skill deficiency with all the variables at play. Hopes this experience doesn't cause us to do away with teachers.
Kelly	4th	<ul style="list-style-type: none"> Believes the experience has placed a greater emphasis on using technology in the classroom. She sees benefits for personalized and differentiated learning using these tools. Sees changes in expectations for the fall virtual learning due to the spring experience. There is more ownership of work and more accountability in this environment.
Julie	5th	<ul style="list-style-type: none"> Seeing implications this fall with an emphasis on social-emotional learning. Believes teachers will see what's important and weed out what's not important. Hopes the experience will continue in the future. She sees benefits this type of learning can afford.
Daisy	5th	<ul style="list-style-type: none"> Seeing implications this fall with the integration of technology but has concerns with the amount of digital learning versus being able to physically hold a book or use pencil and paper in their activities. Believes it has 'put a dent in our education' because so many students are behind now and it's going to take a lot of work to bring them up to grade level.
Elizabeth	5th	<ul style="list-style-type: none"> Hopes future virtual learning options will have dedicated virtual learning teachers. It's difficult to teach both onsite and virtually. Sees the virtual option moving forward but hopes it doesn't overshadow onsite learning options. Sees a greater emphasis on integrating technology and believes it can be a beneficial tool for providing differentiated and personalized learning.

There are commonalities offered within their varying perceptions. Five of the subjects (Abby, Bailee, Kelly, Daisy, and Elizabeth) all believe this experience is placing a greater emphasis on using technology and digital learning methods with instruction, both virtually and in the onsite classroom. Elizabeth and Kelly both see positive benefits for this type of learning with differentiation and personalized learning. Abby and Daisy both expressed concerns about teachers figuring out what technology is most important to integrate rather than trying to integrate technology into everything they do. Hannah, Julie, and Elizabeth all expressed their hope to see the virtual learning provided as options to students in the future, giving students who don't thrive in traditional onsite settings an opportunity to thrive in a virtual learning environment. Daisy and Bailee both expressed concerns with how far behind the students have

fallen and are worried about meeting their needs and not letting them ‘fall through the cracks’. Anne, Sherry, and Abby believe this has provided a new perspective for parents, with Sherry hoping it brings teachers more respect, and Anne and Abby concerned it may change their thinking on homeschool or online charter school options. Kelly and Anne both expressed concerns that this could cause a teacher shortage because of added responsibilities and pressures or ‘do away with teachers’ all together. Julie believes we will see more emphasis on social-emotional learning, and Abby believes the experience is positively impacting education, as it is preparing our students to live in a digital society.

Final Thoughts

All subjects in this study were required to shift from onsite instruction to remote learning methods with very little turnaround, preparation, or training. Most of them had supportive school leaders and teams that helped them through the experience. Some of them had guidance and expectations from a district level while others did not. Some of them had knowledge and use of the technology they were being asked to use while others were learning it as they went. Many experienced feelings of inadequacy and wished they could do more for their students than they were doing. While many of them spoke of the resilience of the students, each of them displayed resilience and powered through a situation that no one could have predicted.

Chapter 6: Discussion and Implications

Overview of Study

This study explored the experiences of elementary teachers during remote learning due to the COVID-19 pandemic and investigated how elementary science instruction in the remote learning environment compared to science instruction in the classroom. Elementary teachers often push science instruction aside to give greater instructional time and emphasis to literacy and mathematics (Blank, 2012; Hayes & Trexler, 2016; Dorph et al., 2011). Evidence from the 2018 National Survey of Science and Mathematics Education (NSSME) study reveals that one of the biggest inhibitors of science instruction in the elementary classroom is the lack of instructional time devoted to science:

Only 17 percent of grades K-3 classes and 35 percent of grades 4-6 classes receive science instruction all or most days, every week of the school year. Many elementary classes receive science instruction only a few days a week or during some weeks of the year.

In 2018, grades K–3 self-contained classes spent an average of 89 minutes per day on reading instruction and 57 minutes on mathematics instruction, compared to only 18 minutes on science and 16 minutes on social studies instruction. The pattern in grades 4–6 is similar, with 82 minutes per day devoted to reading, 63 minutes to mathematics, 27 minutes to science, and 21 minutes to social studies instruction (BaniLower, et al., 2018, p. 77).

If this is the trend for onsite instruction, does the trend continue in remote learning? In a survey of K-8 teachers from 25 states during the first few months of the pandemic, 88% of kindergarten through 2nd grade teachers and 91% of 3rd through 5th grade teachers reported spending less time on science during remote learning (Iveland, Rego, Sarna, & Wolbrink, 2020). This same survey found that the most common instructional methods used by teachers to teach science were watching videos and/or simulations and reading

material online or in print and only 38% of the teachers reported having students do an experiment, lab, or investigation (Iveland, Rego, Sarna, & Wolbrink, 2020).

The study reported here sought to explore how elementary teachers modified their science instruction for remote learning and the conditions that influence that instruction in remote learning. It also explored the conditions that influenced science instruction in the classroom as schools reopened in the fall of 2020. Science instruction is essential for creating scientifically literate citizens who can sift through data and critically examine evidence (National Research Council, 2012) and “it remains essential all students have access to a high-quality science and engineering education” (National Academies of Sciences, Engineering, and Medicine, 2020, Ch1, p.1).

This study also sought to explore what it was like to be an elementary teacher delivering remote learning during the COVID-19 pandemic. Teaching even during normal times is a physically and emotionally demanding job. Teachers are constantly faced with challenges such as classroom management, heavy workload, lack of training, lack of administrative support, lack of parental support, lack of resources, and realities of students and families beyond their control (Mansfield, Beltman, Price, & McConney, 2012). Are the challenges teachers face in the classroom the same challenges they face in remote learning? This study sought to explore these challenges by investigating the delivery methods used, the factors that influenced their experiences, their transitions back to school in the fall, and the teacher’s perceptions of how this experience will influence education.

A discussion of the research findings is presented in the following sections. The main findings as they relate to the two research questions are discussed. Conclusions

drawn from the study are linked to related literature and followed by a discussion of the implications gleaned from the study on elementary science education and with respect to future remote learning situations. Recommendations for future research are offered and final conclusionary thoughts are shared.

Discussion of Key Findings

Key Findings Related to Research Question 1

How did elementary science instruction in the remote learning environment during early response to the COVID-19 pandemic compare with normal or traditional classroom science instruction? Science instruction in the classroom occurred with teachers that had a dedicated science instruction time in either their daily or weekly schedule. Teachers who relied on “fitting it in when possible” typically found themselves not teaching science most of the time. Science instruction in the classroom, prior to remote learning, was more hands-on and inquiry based than science instruction in the classroom after remote learning. Safety restrictions due to COVID-19 are limiting teachers’ abilities to do partner and group work and they are not able to share materials as easily as they did before COVID-19. The students who are in departmentalized classrooms/grade levels receive more daily science instruction (60 – 90 minutes) than those who are not departmentalized (15-30 minutes). Hands-on learning activities were rarely assigned during remote learning and only a few teachers provided demonstrations of experiments to their students during remote learning.

Sub question 1a: How and why did elementary teachers modify science instruction for remote learning? Science instruction during remote learning had to be easy for students to do at home and not require a lot of additional assistance. Activities during remote learning were more independent and self-directed. Students were given links to videos to watch and passages to read

about science concepts. Some students were asked to take nature walks and make observations on their walks. Sometimes at-home activities or experiments were provided as a supplement. Students completing paper packets were reading and answering questions. There were very few hands-on activities or experiments. None of the science lessons in remote learning were required for students to complete and only a few students received activities that communicated new science concepts. Most students completed activities on topics they had already studied in the classroom before remote learning began. Students were excited to attend the videoconferences when teachers demonstrated science experiments. Teachers wanted students to be active at home and wanted to send hands-on activities but were concerned students wouldn't have access to materials they would need. Teachers were unsure of how to engage students in active science through virtual settings. They chose what was easiest for them to plan and what would be easiest for the students to complete. Some of the teachers did not plan the science lessons they posted, using lessons created for them by facilitators or through the state PBS services. Many teachers could not tell me the topic of study in their science lessons each week.

Sub Question 1b: What specific factors influenced elementary science instruction in the remote learning environment? The most influential condition was that so many teachers were told that literacy and mathematics were to be the focus of remote learning. The science lessons were often considered the optional lessons for the week, and when there was science, there was usually only one lesson a week. Very few of the science lessons assigned to students involved hands-on learning experiences. However, three teachers demonstrated science experiments during weekly videoconference meetings with their students. Another factor was that teachers did not have many resources for science instruction to begin with, so moving into a digital learning method cause struggles to find resources they could use. Some teachers had digital

curriculum resources but did not know how to effectively use them in this situation. Additionally, teachers did not know how to engage students in active learning or engage students in discussion in the virtual context, be that in science or any other area. They were new to using videoconferencing tools and other tech tools that could have offered more engaging lessons than they provided. They did not have time to scour the internet for resources to use in a subject area that was not a priority. If science instruction was not a priority in the classroom before remote learning, it would not be a priority during remote learning. The exception to this was with the two kindergarten teachers who emphasized science experiments through their weekly videoconferences and shared the activities with students to do at home. Both teachers had not taught much science in the classroom prior to remote learning, but both emphasized it during remote learning as a means for active learning and parental involvement.

Sub Question 1c: What issues or conditions influenced elementary science instruction in the classroom as schools reopened in the fall of 2020? There were two major influencing conditions on science instruction in the classroom in the fall: the emphasis on literacy mathematics and the safety restrictions and requirements due to COVID-19. Six of the seven non-departmentalized teachers were given directives that literacy and mathematics were to be their emphasis this school year. Of those seven teachers, only three have dedicated instructional time for science in their daily schedules. One of those teachers is teaching in the virtual learning school and has science on a weekly basis, but it is not required for students. When you are told where your priority is to be, you follow those orders. Unfortunately, some of the districts are claiming that science instruction is embedded in their literacy curriculum, so by their standards, it is okay not to have dedicated science time. The safety restrictions and social distancing requirements that teachers are accommodating this year influence the teachers' ability to

effectively engage students in science. With their desks spaced out across the room, there is little room left for movement or materials or projects to be conducted. With all the restrictions on sharing materials, teachers do not have enough materials for students to complete the activities independently. They barely had enough materials to work in small groups prior to the COVID-19 pandemic, so trying to gather materials for 20-30 students in a class is not manageable. The classes that were departmentalized had found ways to structure their rooms and instruction so that small groups of students could work together safely and handle materials safely as well. When science is the subject you teach, you find ways to make it work.

Key Findings Related to Research Question 2

What were elementary teachers' experiences as they pivoted from onsite classroom instruction to delivering instruction via remote methods during early response to the COVID-19 pandemic? Elementary teachers were placed under a great deal of stress and anxiety during their remote learning experiences. Teachers were expected to deliver instruction through digital tools that were often new or unfamiliar and then were not given clear guidelines or expectations for how to handle student participation, attendance, assignments, etc. They relied on the support of their teammates, who were going through the same experience for the first time too. They turned to social media and found themselves feeling inadequate when they would see the magnanimous things other teachers were doing. The game of compare was an evil obstacle for many teachers. Teachers found themselves trying to balance their families and work and home all under the same roof at the same time. They worried they were not doing enough for kids and wondered if their kids were safe and secure. They were frustrated because they could not provide new learning opportunities but had to continue to review prior concepts. They were frustrated when

students got bored and were no longer motivated to do their work. They did the best they could, with what they had.

Sub Question 2a: In what ways did elementary teachers deliver instruction through remote learning? All the teachers in the study used digital methods, at some point in the experience, to deliver instruction remotely. Half of the teachers in the study had choice in determining the digital method of delivery for their students. *Google Classroom* was the most common platform for delivering instruction. Paper packets were used when accessibility to reliable internet was not an option and typically were different from the work being assigned online, consisting of more worksheet-style activities with reading passages and answering questions. Students with the online methods were able to receive more timely feedback on their work than those with packets. Teachers also used videoconferencing to deliver instruction and engage students in social-emotional learning activities. *Google Meet* and *Zoom* were the typical platforms used for videoconferencing. Unfortunately, many had issues with privacy and security at the beginning of the remote learning experience, and for this reason, one of the subjects would not host live meetings with her students. She did not want to take any chances with a security or privacy breach, so she opted to record all her lessons for students to watch at their convenience. Most of the instruction was provided in asynchronous manners, with only a small bit of time each day or week to synchronous meetings with students. Most teachers opted to hold whole class videoconference meetings, while a few held meetings with/for small groups of students. Small group meetings were typically focused on instructional support in literacy and mathematics, like guided mathematics or reading groups in the classroom. The whole class meetings typically focused on engaging students in social-emotional learning activities, keeping things light and fun. With exception of a few teachers, most teachers did not have any guidelines

pertaining to how much instruction they were to deliver, how much time to spend in videoconference meetings, or what they were to do in those meetings. Many of the teachers saw inequities arise across their campus and district due to lack of expectations which caused a lot of stress and frustration.

Sub Question 2b: What factors influenced their experiences with remote learning? The overarching factor that influenced of the teachers' experiences was that of administrative expectations, or the lack thereof. Teachers had no frame of reference for what they should expect in a situation like this, so they struggled when they were not given set boundaries and guidelines to support them. Over half of the teachers in the study were not given expectations for student attendance or participation. Some of the schools created their own expectations but for the most part, teachers had no method for taking attendance during the experience. One district in Arkansas and the three in Texas provided general guidelines of completion of an assignment each day or per week. Expectations for grading student work were more ambiguous and many decided to count their work as participation grades only. All the fourth quarter grades were a mirror of the students' third quarter grades, per state mandate. They were not allowed to lower a student's grade during fourth quarter or penalize them for not completing their work. The other expectation that caused great frustration with teachers was the directive to give review work only, but no new instruction. Only four of the teachers in the study could progress with new content. This led to reports of boredom for both the student and the teacher, and many students recognized they would not get penalized and it was just review, so they quit working. While the teachers wanted to continue with new instruction, student completion of work was not reliant on having new instruction. The two highest percentages of student work completion came from a fifth-grade class (95%) and a kindergarten class (94%) that were both doing review instruction.

Teachers that continued with instructional progressions, or new learning, had between 72 and 88 percent of students completing their work. That same fifth grade class had the highest percentage (86%) of student participation in videoconferences, too.

Another influencing factor was the communication with parents. Several of the teachers could not reach all their parents. This caused anxiety for the teachers because they had no way of knowing how these students were doing, if they were safe and secure, or if they had food. Some of the teachers already had communication tools in place prior to remote learning, but they did not have every parent signed up or registered with the tool. When this happened, they had to use multiple methods of communication to send the same message to different parents. It was hard to manage with multiple replies to the same question or issue. Many recommended implementing consistent parent communication method that could be used school- or district-wide as they reflected on the experience. They also struggled with how often to communicate with parents because they did not want to overwhelm, or stress parents out more than they already were. Parents questions in the first few weeks of remote learning were about the expectations, procedures, and technology issues. Teachers found themselves trying to troubleshoot technology issues they did not understand and often tried to do this via email. It was difficult to impress the seriousness of the remote learning on parents without clear expectations.

Technology was another influencing factor in the remote learning experience. Inequity across the districts was often seen most with the technology factor. Access to reliable internet was a determining factor as to if the student received a paper packet or if the student was able to complete their work online. All the districts offered ways for students to check out devices, but they did not all have ways to offer internet to all their students. Teachers did not know how to use the technology they were trying to teach their students to use. They did not know how to

troubleshoot issues and struggled when district privacy settings restricted student access to resources they were linking in their lessons. While they typically could send an approval request to their technology department and get the issue resolved, it was one more thing for them to do each time they shared new links. Many parents did not know how to use the technology either, so they couldn't help their students. This caused a flurry of emails each time there were links not working or issues with student technology. Teachers then had to respond to each of the emails after the issue was resolved. Teachers did not always have reliable or appropriate devices to use for their remote learning. Some of the teachers were working on Chromebooks they used in their classroom with students and did not have all the functionality features they needed to adequately do their job. Students had not always used these platforms before, so there was a learning curve for them as well. They did not know the expectations for doing work online, nor had they been exposed to online safety and digital etiquette. This led to some cyberbullying issues and some inappropriate use of technology. This issue was the catalyst for a few districts to purchase *Go Guardian*, a software application to help teachers manage online activity and encourage safer online practices. While technology struggles were often frustrating, teachers all expressed their appreciation for the experience and how it enhanced their technology skills. Many of the teachers researched online tools and began using them for their lessons. Many of the teachers learned alongside colleagues to determine how to effectively use tools with their students, and many teachers found the students taught them a thing or two as well. Several of them saw the potential benefits of integrating these tools in the classrooms and using them to support differentiated or personalized learning options.

Balancing the work-home-family life was another influencing factor in the experience. While some of the participants enjoyed the flexibility of the experience and did not struggle

balancing the loads, others found it extremely difficult to manage in this this experience. Some were trying to watch their own children while keeping up with the demands of the job. Many of the teachers found it difficult to walk away from the computer, as it was always there, a constant lure. Some managed the situation by creating a schedule of set work hours and informing their parents of this times. If parents or students messaged after their hours, they would respond the next day. Others found themselves responding to parents and students at all hours of the day and night.

Feelings of inadequacy plagued several teachers during the experience. Many expressed feeling that they weren't doing enough for their students and that they weren't teaching or doing their job. Several struggled with their lack of knowledge and use with technology and felt they that prohibited them from doing certain things with their students. Several teachers compared what they were doing to what others were sharing they were doing, either on social media or in faculty meetings, and this often caused more negative self-talk. Teachers who were experienced and capable in the classroom found themselves grappling to teach in this situation.

Another factor that influenced the experience was the inequity many teachers saw across their students, across their campus, across their district, and even across their state. Many expressed concerns about the academic experiences that were inequitable and were concerned about the learning that students were missing. Students who received paper packets did not receive the same academic experiences of those doing online learning. The work was not aligned and often very different to accommodate paper delivery. It was often difficult to know who was doing the work that was submitted and how much assistance was provided at home. Some of the teachers saw struggling students become "geniuses" overnight and suspected the parents were doing the work for their child. Teachers had no way to know if the parent had submitted the work

or if the child had done it. Sometimes it was obvious, while other times it was very hard to decipher. It was also difficult for some teachers to know that their students who received special services in the classroom were not getting the same quality of services if they were getting them at all. Paper-based instruction was usually the same for all students who received it, but teachers could differentiate and personalize the online work for varying learning levels to a certain degree. Inequity was also seen across the work given by other teachers in the grade level at other campuses in the district. It was hard to know if you were providing the same quality of instruction as others, especially with little to no curricular guidance from the district.

A specific influencing factor was present in Abby's experience. As a first-year teacher, she was still trying to figure out how to teach in the classroom when she had to shift to teach online. She found it difficult to try to reconfigure how she was teaching in the classroom to a virtual classroom, with no kids for feedback and interaction. She did not have prior training in educational technology practices and had not been using a lot of technology with her students, so they had a crash-course on how to use *Google Classroom* the day prior to the school closure weekend. It was difficult for her to teach new standards in the fourth quarter when she had not even taught them in the classroom before. She did not know what they needed to look like and wasn't comfortable providing new instruction all time. She did not have the models of her teammates' classroom to step into and watch or learn from either. She felt like a first-year teacher all over again in the fall as she had to readjust to new requirements and restrictions in the classroom and work with new curriculum being implemented.

Sub Question 2c: What issues or conditions influenced instruction in the classroom as they transitioned back to school in the fall of 2020? Schools opened their doors both onsite and virtually in the fall. All the schools offered virtual learning options, with all but two having

dedicated teachers that delivered the virtual instruction. The two departmentalized teachers were providing both onsite and virtual instruction during their day. Districts learned from the remote learning experience and have placed more rigorous expectations on the virtual learning than what teachers had in the spring. They are mirroring the onsite classroom instruction more closely and following district pacing guidelines. The biggest changes have been seen in the physical environments due to safety restrictions and social distancing measures. Classroom arrangements are impacted with desks being in rows facing the front, spaced six feet apart. It's difficult to share materials, and if you do share materials, there are strict cleaning guidelines. All teachers interviewed reporting not having enough materials for students to use individually, so many opted not to use the materials or manipulatives, leading to less active classwork. Teachers are also finding they are integrating technology more in the classroom and most started the students on the technology day one. They have been instructed to be ready to pivot to remote learning procedures at any time. Districts have determined consistent platforms for use and students are learning the expectations. Teachers are concerned about the amount of digital learning versus active, hands-on learning, or paper/pencil activities. Unfortunately, much of the digital learning is being imposed so it's not a choice. Several of the teachers are implementing new curriculums this fall, which adds to stress and anxiety in an already very stressful environment. The teachers interviewed who are implementing new curriculums reported that trying to teach in the COVID environment was difficult enough without the added stress of learning new curriculum and materials. Some of the teachers expressed feeling like they were just 'tech facilitators' because the curriculum is scripted, telling them everything to say and do, so they just push play and watch. Many of the teachers shared how exhausted they were this fall. They are still doing all their typical duties and responsibilities as a teacher, but they also have added responsibilities of

cleaning, monitoring the students before their official work hours begin, and even losing some of their “off” time during the day to additional duties. They have more time in the classroom with students and seem to be with them “all the live-long day” as Sherry said.

Sub Question 2d: What are elementary teachers’ perceptions of how this remote learning experience will influence education in the future? Teachers believe this experience is placing a greater emphasis on digital learning and the use of technology in the classroom. Some reported positive benefits to this emphasis and would like to see it used for more differentiated and personalized learning options in the classroom while others are concerned that we are digitizing too much in the classroom. They hope we can figure out what should be integrated digitally and what is not as important, finding a balance with digital and traditional classroom practices. Several of the teachers hope that virtual learning remains an option for students beyond this year, seeing the potential for students to thrive in non-traditional settings. Some of the teachers are concerned with the massive gaps in learning they are already seeing and wondering how they are going to mind the gaps this year. Other teachers believe this has provided a new perspective for parents and we may see more parents choosing to homeschool or enroll students in online schools, decreasing the need for public school teachers.

Conclusions Linking Research Findings to a Review of the Literature

This section describes the conclusions of the research study findings as they are connected to the review of literature provided in Chapter 2. Five key conclusions from this research study are offered with a discussion of evidence from the study as linked to the research literature. Following the conclusions, a discussion of the implications suggested by the results of this study for elementary science education in general and with respect to future remote learning situations is presented, with recommendations for future research provided afterwards.

Conclusion 1: Science instruction is not considered an essential element of elementary classroom instruction. “Science should be as nonnegotiable a part of basic education as are language arts and mathematics” (National Research Council, 2007, p. 34) yet we still have administrators giving directives for elementary teachers to focus on literacy and mathematics. Science instruction in elementary grades helps students turn their curiosities about the world around them into sensemaking opportunities that develop critical thinking skills and habits of mind that will allow them to participate in society as a scientifically literate citizen (Beatty & Schweingruber, 2017; Patrick & Mantzicopoulos, 2015; National Research Council, 2012). Unfortunately, many teachers, administrators, and parents do not realize how much science and engineering is used in our daily lives, thus they may not recognize the importance of engaging students in science and engineering learning experiences. The view that literacy and mathematics have priority in education is often mirrored in our parents’ views, too.

To feel empowered as full partners in supporting their students’ science and engineering learning, families and community members may need help understanding the importance of science and engineering education. Some families view science as less important than other subjects, such as reading writing, and mathematics...Once families share a vision of the critical role science and engineering play in their children’s lives, they can also be powerful advocate in districts and states to ensure science and engineering coursework is available for all students – including throughout elementary school (National Academies of Sciences, Engineering, and Medicine, 2020, Ch.3, p.6).

Experiences during this global pandemic serve as examples to demonstrate the urgency of developing students who can critically evaluate and make sense of the data and claims presented in our media-saturated society. Willard, former Standards Implementation Specialist for the National Science Teachers Association, and author of *The NSTA Atlas of the Three Dimensions*, shared similar thoughts about the importance of science education for all students in his October 2020 post about *Creating a New Understanding of Science Education*:

People regularly face questions that require an understanding of science, from personal issues such as data privacy and gene therapy to global threats such as pandemics and

climate change. Science learning is essential for students' success in life, and for the well-being of society.

Conclusion 2: *Elementary science instruction during remote learning decreased and was less engaging than their science instruction in the classroom.* Students need meaningful learning experiences that will help them make sense of the world around them, whether they are in a physical classroom or learning from home. Teachers in this study report that students who were not in departmentalized classes (receiving instruction provided by a different teacher for each subject area) received less instruction or opportunities to engage in science related activities during remote learning than they would have received in their classrooms. The two departmentalized teachers presented students with daily assignments in science, while seven of the teachers presented students with a weekly science lesson or activity that was usually considered optional, and one of the teachers only provided science activities twice during the experience. Several teachers admitted that the science activities used were not aligned to their grade level standards but fit the theme of their learning for the week or were something they thought the students would enjoy. Findings from this study showed that students in remote learning were reading passages or watching videos about science topics and then answering basic knowledge and comprehension level questions as their science lesson for the day, which was the opposite of how most of them engaged their students in science learning in the classroom. Only three of the teachers in this study conducted experiments for their students to watch and discuss, and rarely did teachers assign a hands-on project during remote learning. These findings echo results from the 2020 study *Science Learning During COVID-19 and Beyond* that found 88 percent of K-8 teachers spent less time on science during remote learning, 80 percent used reading material, and 87 percent used videos or simulations from online sources (Iveland, Rego, Sarna, & Wolbrink, 2020). The same survey found 38 percent of K-8 teachers engaged students

in doing an experiment, lab, or investigation while only 25 percent of K-8 teachers demonstrated an experiment, lab, or investigation (Ivland, Rego, Sarna, & Wolbrink, 2020). Engaging students in active learning is still essential in the virtual learning environment, but teachers have to know how to adapt their practices to engage learners remotely (Hanover Research, 2015). Very few teachers in this study provided hands-on or active learning experiences in science for their students during remote learning. “Whatever approach is used, it remains essential that all students have access to a high-quality science and engineering education” (National Academies of Sciences, Engineering, and Medicine, 2020, Ch.1, p.1).

Conclusion 3: *Successful implementation of remote learning options requires clear expectations and guidelines for teachers, students, and parents.* If we do not know what is expected of us, how will we know what to do to succeed? All the teachers in this study struggled with ambiguity of expectations and lack of clear guidelines or boundaries for their work in remote learning. While a few of them were given guidelines for instructional schedules during the week, none of them knew what online instruction should look like or what to expect of students for participation and assignment completion. In the 2009 report, *10 Principles of Effective Online Teaching: Best Practices in Distance Education*, Ragan explains that organizations must articulate what they expect from online instructors “in order to ensure a quality teaching and learning experience” (p. 4). Expectations in the classroom setting do not automatically translate to the online setting. “It is our responsibility to provide the instructor with the best definition of successful performance for their success and the success of their students” (Raglan, 2009, p. 4). Raglan explains how the remote learning environment differs from the known expectations and parameters we use in the physical classroom:

The asynchronous online classroom has little or no similarity to the classroom experience. There may be no “class schedule,” no meeting room or physical location,

and, certainly in the asynchronous classroom, no defined timeframe for operation. Even the dynamics between teacher and student is challenged because online we can all appear to “be equal.” Other than a vague sense of responsibility to “teach the course,” the instructor has little definition of these new and often ill-defined operating parameters. The course instructor is left on their own to figure out what constitutes a successful learning experience (2009, p.4).

Teachers in this study found themselves thrust into a remote learning situation with no prior knowledge of what virtual learning with elementary students would entail. They struggled without the traditional schedules and routines and were often left on their own to determine what their students’ learning experience would be. To promote academic rigor in online courses, instructors should have clear and high expectations and make their grading criteria explicit (Hanover Research, 2015). “Clearly defining and communicating the expectations will address the uncertainty of what role and responsibility is required of each participant” (Ragan, 2009, p. 8).

Many of the questions the teachers in the study received from parents centered on what was expected of their child. It was difficult for the teachers to answer this question when they did not have a clear understanding of what was expected of those students either. The absence of expectations led many parents and students to see the remote learning experience as essentially an optional type of experience, especially since there were no academic consequences when students did not submit work or participate in class meetings. While the decision for grades to carry over into the fourth quarter was made as an effort to not penalize students for the shift to remote learning, it reinforced the perception that the learning experience was optional and unimportant. “An unintended consequence of this approach was that some students disengaged with their homework and did not turn in assignments” (Elish-Piper, 2020, p. 40).

Academic disparities shared by teachers in the study could be eliminated with clearly defined expectations from their school leaders or district administrators. Teachers were left on their own to determine the standards they would have for instruction, grading, and student participation. When teachers are left to determine their own standards, it leads to wider variations between courses, instructional practices, and grading practices (National Academies of Sciences, Engineering, and Medicine, 2020; Hanover Research, 2015; Ragan, 2009). Many teachers in the study discussed concerns about academic equity across their team, among the teachers in their school, and within their grade level across the district. They had no way of knowing if they were expecting too much or too little from their students or if their lessons were providing the same quality of experience as other teachers were providing. Parents who were able to support their child at home had no way of knowing if their support was appropriate or when it was appropriate to give their child assistance. Struggling learners often fell even further behind because they did not have support at home and were not receiving additional support in the remote learning environment like they did in the classroom. “The shift to remote learning could further limit underserved students’ access to educational supports” (National Academies of Sciences, Engineering, and Medicine, 2020, Ch. 3, p.12). Assignments were typically given with a one-size-fits-all approach, meaning students who typically received accommodations or additional support in the classroom were expected to complete the same assignments as other students without additional support services. Teachers also expressed concerns over the differences in the work they sent home via paper packets versus the work assigned online, claiming the paper packets were more busy-work type activities than learning experiences like they were providing online.

Conclusion 4: *Proficiency with instructional practices in the onsite classroom does not always equal proficiency with instructional practices in the virtual learning environment.*

Transitioning to a remote learning format forced teachers into new roles and responsibilities different from those they had in the onsite classroom. Teachers with proficient or exemplary instructional practices in the classroom may not exhibit the same level with instructional practices in the online classroom. The Southern Regional Education Board (SREB) explains this relationship in their *Guidelines for Professional Development of Online Teachers*:

Research shows that a teacher's skill in face-to-face teaching does not necessarily transfer to an online classroom. In a traditional class, the teacher combines instructional and content knowledge to determine which instructional strategies, activities, and assessments to use. Technology is rarely the primary means of communication. In online instruction, the teacher must combine instructional and content knowledge with technology and rely on technology as the means of communication. Online teaching requires an expanded set of technology skills (2009, p.2).

During the remote learning experience, teachers had to adapt their instructional practices and utilize technology in new contexts. "Teachers must understand how to use relevant and necessary technology to guide students' learning. A poor understanding of technology may negatively impact an instructor's communication and instruction" (Hanover Research, 2015, p.9). All the teachers in the study learned to use new-to-them digital tools and platforms and enhanced their learning in programs they were already using in the classroom. "Teachers often cannot find their place among technologies or the right method to teach elementary school students online" (Burdina, Krapotkina, & Nasyrova, 2019, p. 13). Since they were new with many of these tools, it was also difficult for them to respond to technical problems or support parents with troubleshooting issues, creating another level of frustration and stress each week.

It can be challenging to modify pedagogy for online learning (Hanover Research, 2015) and many of the teachers in the study found these challenges led to feelings of inadequacy and

diminished their teacher self-efficacy. Teachers recognized they were not providing instruction at the same level they did in the classroom, compared themselves to other teachers they saw in social media outlets, became overwhelmed with the stress of the new technologies, and felt inadequate in the situation. Thus, demonstrating that a teacher who had high perceived self-efficacy in classroom instruction may have experienced drops in their perceived self-efficacy when they were tasked with doing something foreign and unfamiliar (Ashton, 1984). The self-efficacy that teachers felt in the classroom did not transfer to the remote learning environment because they were working with new technologies, felt pressure to know and use a variety of digital tools, and were doing this while dealing with a global crisis, too (Watson & Watson, 2007; Ashton, 1984).

Even with any understandable feelings of inadequacy, the teachers learned how to use the technology they needed to provide their students with engagement and learning opportunities, and in this way they demonstrated a resilient sense of efficacy, sticking with their goals, even in the midst of struggles that arose (Bandura, 1994). The teachers in the study demonstrated characteristics of resiliency by persevering in adverse situations, adapting to change, and doing what it takes to get the job done (Mansfield, Beltman, Price, & McConney, 2012). This resiliency was fostered by positive and healthy support systems from their school leaders, teammates, and peers throughout the remote learning experience.

Conclusion 5: *Experiences using technology in remote learning provided new perspectives to teachers regarding the integration of technology in the classroom.* The remote learning experience offered teachers an opportunity to explore and use many educational technologies they may not have used otherwise. Many educational software and application companies offered their services for free or at reduced rates for teachers during in the spring

2020, opening the door to new resources for them to explore and use with their students. Several of the teachers appreciated having the opportunity to try out new products without spending any additional money. They also learned new ways to incorporate instruction through screen recording tools and video narration. Several teachers saw new ways provide instruction in their onsite classroom while using the programs and tools during remote learning. One of the most common ways teachers saw using their new learning was with differentiation and personalized learning options in the classroom. Online learning and blended learning options provide ways for teachers to maximize student productivity and offer advantages in tailoring learning opportunities for students (iNACOL, 2015; Wallace, 2009). Using learning management systems or platforms to deliver assignments gives teachers flexibility in assigning tasks to specific students or groups of students and can provide opportunities for independent acceleration or remediation (iNACOL, 2015; Toppin & Toppin, 2015; Wallace, 2009). Differentiation in the classroom can be challenging, and many of the teachers in the study offered the integration of such platforms as a solution for supporting their differentiation efforts.

While integrating technology in classroom instruction is often advantageous, many of the teachers expressed concerns about the amount of instructional time students were spending on technological devices and wondered if they had lost a balance of instructional delivery. Blended learning models are not designed to have students on the computer throughout the entire instructional day, they are designed “to place the student at the center of the learning process, harnessing the power of technology to create more engaging, efficient, and success-oriented learning environments” (iNACOL, 2015, p. 4). In other words, it’s a pedagogical approach that combines the best instructional practices with face-to-face learning and utilizes technology to enhance the learning activities and promote student success. While teachers appreciated the

efforts their schools were making to ensure students were prepared to learn online in case they had to pivot to remote learning, they were also concerned about the lack of physical learning materials in the hands of their students. Safety restrictions seem to be eliminating the use of manipulatives and real objects that students tend to use in the physical classroom and those are being replaced with online options. Some of the teachers shared how disappointed their students were that they couldn't hold a real book or use paper and pencil to do their activities. So, the teachers are faced with the dilemma of knowing when its most effective to integrate technology and when they need to incorporate their onsite best practices.

Implications Suggested by the Results of this Study

For Elementary Science Education in General

There are several implications from this research study for elementary science education. One implication further confirms that science instruction is not valued as an essential component of elementary classroom instruction even after years of science education reform efforts (Beatty & Schweingruber, 2017; National Research Council, 2007; DeBoer, 1991) and with a new vision for science education as presented in *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* (National Research Council, 2012). Educators at all levels need to understand the role that science instruction plays in the development of critical thinking skills, communication, examining and evaluating evidence, and creating citizens who are able to discern based on understanding concepts of science (Beatty & Schweingruber, 2017; National Research Council, 2012; Michaels, Shouse, & Schweingruber, 2008; National Research Council, 2007; National Science Teachers Association, 2002). Another implication involves the elementary classroom teacher's ability to integrate science instruction with literacy and mathematics instruction to maximize instructional time while providing opportunities for

students to engage in science. “Meaningful connections can be made between different academic disciplines, such as integrating science and literacy instruction” (National Academies of Sciences, Engineering, and Medicine, 2020, Ch.5, p.14). Science provides engaging and meaningful contexts that supports learning in other areas of the curriculum, maximizes instructional time when integrated, and increases coherence in disciplinary connections (National Academies of Sciences, Engineering, and Medicine, 2020; Clark & Lott, 2017; Kysilka, 1998; Beane, 1995). It is important to note that while integration of science and engineering can enhance and maximize instructional time, simply reading a science-themed text in literacy is not sufficient for science instruction. A third implication involves science instruction in remote learning or online environments. Moving learning to an online platform does not mean all active learning and engagement ends. Students should be engaged in hands-on activities at home and should also participate in collaborative projects that support sensemaking and problem-solving (National Academies of Sciences, Engineering, and Medicine, 2020; Kirkland, 2020). While students may not have the same materials used in classroom science activities, there are ways to engage learners at home and through online simulations that will promote sensemaking and investigating phenomena. Teachers need to understand how to facilitate discussions they would typically have in the classroom using online tools and methods.

With Respect for Future Remote Learning Situations

Several implications regarding remote learning situations can be made from this study, and many of these implications are being addressed as schools reopened in fall 2020 and recognized that changes needed to be made to their virtual learning plans. The most prominent implication is regarding establishing expectations for remote learning. Expectations should be clear, well communicated, and monitored with accountability measures so that teachers, students,

and parents understand the criteria for success (Hanover Research, 2015; Ragan, 2009). Districts need to support their teachers in terms of exactly what kind of instruction should be provided, the frequency and duration of that instruction, and how they are to deliver the instruction. They should provide expectations on communicating with parents and students and provide consistent methods for this communication. Students should understand the expectations of participation, completion of assignments, and appropriate use of technology involved in their learning. Parents need to know expectations for communicating with teachers, working with their students at home, and understand the expectations of their student's success criteria. Another implication with remote learning involves teacher training with technology and providing appropriate technology for teachers to deliver instruction remotely. Technology is a key component when delivering instruction online and should be a priority investment if districts opt to use remote learning (Toppin & Toppin, 2016). Teachers need to have professional development opportunities to learn the new technologies and programs and should be given opportunities to practice using them before they are required to implement them with students. Teachers should also be trained in how to effectively troubleshoot and support students and parents with the technology at home. Professional development should be ongoing and keep teachers relevant with curricular and instructional practices involving technology and digital learning tools, like learning management systems, videoconferencing tools, digital recording tools, and tools for collaboration and active engagement (Greene & Hale, 2017; Southern Regional Education Board, 2009). Another implication for future remote learning experiences is understanding how important teacher support systems are to teachers when they are isolated and working remotely. Support systems such as mentoring, administrator support, and the support of peers and colleagues will be essential for teachers to feel connected and demonstrate characteristics of resiliency (Mansfield,

Beltman, Price, & McConney, 2012). Providing virtual support meetings, online communities or chat groups, and regular check-ins with teachers will keep them connected and offer them opportunities to support each other in the process. Finally, connections and relationships with students and parents are critical to success with remote learning from home. Students need to feel connected and engaged in a community of learners and parents need to feel that they are partners in their child's learning (Kirkland, 2020). "Providing mental and emotional supports will be critical, and building relationships is key to supporting students' mental and emotional well-being" (National Academies of Sciences, Engineering, and Medicine, 2020, Ch. 3, p.7). It is vital for teachers in virtual classrooms to build community online and encouragement student engagement in social-emotional learning activities. It will also be important for teachers to keep open lines of communication with students and parents to stay abreast of student and family needs. Teachers will need to collaborate with other educators and service providers to ensure that students are provided the supports they need and to ensure the individual teacher is not doing it all alone.

Recommendations for Future Research

As mentioned in the literature review, presently there is very small base of literature around remote learning in the elementary grades (Greene & Hale, 2017; Rice, 2006) but this is expected to grow exponentially because of the recent unique opportunity to study such learning. We are seeing rapid growth in online learning and virtual school options in the United States (Toppin & Toppin, 2016) and the experience with remote learning during the COVID-19 pandemic will most likely influence enrollment in these options in the future. Future research should be conducted to explore instructional best practices with elementary students in online and blended learning environments. The research base for instructional practices with online or

distance learning is rooted in the secondary and higher-education settings (Burdina, Krapotkina, & Nasyrova, 2019; Hanover Research, 2015; Cavanaugh, Barbour, & Clark, 2009) so understanding appropriate practices for use with elementary students would support the future of remote learning in elementary education. Other research opportunities include engaging elementary students in science instruction online and instructional technology to support elementary teachers with engagement and collaboration techniques in virtual settings. The COVID-19 pandemic has presented us with opportunities for research that we never expected and will undoubtedly offer a new perspective to our educational endeavors.

Conclusion

This study provides a rich description of the experiences of a select group of teachers with remote learning during the COVID-19 pandemic and explores their science instructional practices during the demands afforded by remote learning. The findings of this study show that science instruction in elementary classrooms is still not considered as important as literacy and mathematics instruction. The findings also show that during remote learning, science instruction decreased and was less engaging than the science instruction in their classrooms. Teachers in the study were aware of the discrepancy in their instructional practices with science during remote learning but did not have the capacity to change them at the time. COVID-19 safety requirements and restrictions have hindered active, hands-on science instruction this fall.

The results of this study also provide a description of how the teachers handled the adversity and teaching during a crisis. It demonstrates their resiliency and efforts to teach in any manner needed for their students. It also provides evidence to support the need for district level guidance and expectations for future situations of this nature. Districts must listen to their

teachers, gather feedback from them on the experience and work to establish procedures for this type of learning experience in the future.

As we continue to fight the COVID-19 pandemic, our schools and teachers are on the frontlines working with our students to ensure their social, emotional, mental, physical, and academic needs are met. Teachers are working harder than ever and rarely get the respect they deserve. Even though the remote learning experience showed us the importance of technology and the possibilities of online learning, it also showed us the critical role teachers play in the lives of our students and in their educational journey. The words of Helen Caldicott, Australian physician, and activist, in her 1992 book, *If You Love This Planet: A Plan to Heal the Earth* summarize this belief effectively: “Teachers, I believe, are the most responsible and important members of society because their professional efforts affect the fate of the earth.” (p.178)

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Appendices

Appendix A: IRB Approval



To: Beth Ann Pesnell
From: Douglas James Adams, Chair
IRB Committee
Date: 04/13/2020
Action: Expedited Approval
Action Date: 04/13/2020
Protocol #: 2003259607
Study Title: Teacher Resiliency in Crisis: Delivering Alternate Methods of Instruction on Demand
Expiration Date: 03/30/2021
Last Approval Date:

The above-referenced protocol has been approved following expedited review by the IRB Committee that oversees research with human subjects.

If the research involves collaboration with another institution then the research cannot commence until the Committee receives written notification of approval from the collaborating institution's IRB.

It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date.

Protocols are approved for a maximum period of one year. You may not continue any research activity beyond the expiration date without Committee approval. Please submit continuation requests early enough to allow sufficient time for review. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study closure.

Adverse Events: Any serious or unexpected adverse event must be reported to the IRB Committee within 48 hours. All other adverse events should be reported within 10 working days.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, study personnel, or number of participants, please submit an amendment to the IRB. All changes must be approved by the IRB Committee before they can be initiated.

You must maintain a research file for at least 3 years after completion of the study. This file should include all correspondence with the IRB Committee, original signed consent forms, and study data.

cc: Bill McComas, Investigator

Appendix B: Invitation to and Consent to Participate in a Research Study

As we find ourselves entering uncharted waters in education due to the quarantine measures surrounding CO-VID 19, we also find a unique and natural opportunity to research teachers' perceptions and strategies for remote instruction within Elementary education.

I would like to invite you to participate in a non-interventional research study regarding your experiences in shifting from a physical classroom instructional environment to the online or remote instructional environment. This study would be non-interventional (I will not provide coaching, ideas, strategies, input, etc.), but focus solely on your perceptions, reflections, and instructional shifts during this time.

The study would involve a brief introductory survey capturing basic demographic information that will take about five minutes, as well as one-on-one interviews via *Zoom* video conferencing on a weekly basis until the end of the current school year. Interviews will take between 30 minutes and an hour each week. All information collected will be kept confidential to the extent allowed by law and University policy and no identifying information will be used in any report or publications resulting from this research. This study is being conducted in fulfillment of requirement for dissertation and degree completion of a PhD in Curriculum and Instruction.

Please let me know if you would be interested in participating!

Thank you,

Beth Pesnell, CIED Doctoral Candidate, University of Arkansas
bapesnel@uark.edu

Dr. William McComas, Faculty Supervisor, University of Arkansas
mccomas@uark.edu

If you have questions or concerns about your rights as a research subject, please contact Ro Windwalker, the University's IRB Compliance Coordinator, irb@uark.edu.

Appendix C: Research Subject Introductory Survey

The following was sent to subjects via a Google Survey Form:

1. Grade Level

Dropdown options with each K-5 grade level

2. Where do you teach? (District/State, short response)

3. How many years have you been teaching?

Options: 1-2 years, 3-5 years, 6-9 years, 10-15 years, 16-20 years, 20+ years

4. During this time of remote learning, how are you delivering instruction?

Options: online, paper/home packets or materials, both online and paper/home packets

5. What is your greatest challenge during this time of alternate learning? (open response)

6. Consent to participate (yes/no)

I give my consent to participate in this research study. I understand my information will be held confidential to the extent allowed by law and University policy and will be used for the sole purpose of this research study. No identifying information will be used in any report or publications resulting from this research.

7. Agree to interviews being recorded (yes/no)

I agree to attend weekly zoom interviews through the end of this school year and give my consent for the interviews to be recorded. The weekly zoom interviews will be recorded and used by the researcher for data collection and transcription. The recordings will be held secure throughout the research phase and will be destroyed after the study is completed.

Appendix D: Semi-structured Weekly Interview Questions

Week 1

1. What were your initial thoughts and reactions to the announcement you'd be going to a remote/alternate method of instruction?
2. Describe the "turnaround" time for implementing remote methods of instruction in your district.
3. Describe the remote methods of instruction you are using. (online methods, home packets/materials, combination)
 - If using online methods:
 - How many of your students have access to a device and internet?
 - What devices are they using? (home/personal, school administered)
 - Describe how you are managing your online instruction? Are you using a learning management system? (like *Google Classroom*)? If so, how are you using this system?
 - Describe your online classroom (or remote learning) routines/procedures?
 - If using home packets/materials:
 - How are these distributed? How often?
4. How has your instructional planning changed? How have you altered lessons for remote learning?
5. What does your science instruction look like?
6. Describe the resources you are using. Where are you finding your resources?
7. How are you providing instruction versus assigning work? What grading practices are you employing?
8. Describe how you are connecting with your students and keeping the relationships through the virtual/remote environment.
9. Describe how you are communicating with parents/caregivers.
10. How is your faculty and/or team communicating?
11. What are your "next steps" for Week 2? Is there anything you plan to change/modify?

Week 2

1. What are your thoughts and reactions about your experiences this week with your remote instruction?
2. Describe any changes or modifications you made to your remote instruction from last week.
3. How are you addressing the various needs of your students? (differentiation: SpEd, ESL, etc.)
4. How did you connect with your students this week?
5. Describe the level of participation from your students this week.
6. Describe the communication between you and parents/caregivers this week.
7. Describe how your faculty and/or team communicated this week. Were there any changes from last week?

8. How would you describe the support you're being given by?
 - a. School Administrators?
 - b. Team members?
 - c. District Level Support Personnel?
 - d. State Level Personnel?
9. What are your 'next steps' for this coming week? Any changes or adjustments?

Week 3:

1. Describe your experiences this week.
2. Describe your stress and emotional level.
3. Describe how you are balancing remote learning, home life, family life.
4. Describe your instruction this week and any changes or modifications from last week.
5. Describe how you perceive your students' well-being/social-emotional status.
6. Describe the level of participation/engagement from your students this week.
7. Describe the communication between you and parents/caregivers this week.
8. What are your 'next steps' for this coming week? Any changes or adjustments?

Weeks 4 & 5:

1. Describe your experiences this week.
2. Describe your instruction this week and any changes or modifications from last week.
3. Describe how you connected with your students this week.
4. Describe the level of participation/engagement from your students this week.
5. Describe the communication between you and parents/caregivers this week.
6. What are your 'next steps' for this coming week? Any changes or adjustments?

Week 6:

1. Describe your experiences this week.
2. Describe your instruction this week and any changes or modifications from last week.
3. Describe how you connected with your students this week.
4. Describe the level of participation/engagement from your students this week.
5. Describe the communication between you and parents/caregivers this week.
6. What are your 'next steps' for this coming week? Any changes or adjustments?
7. Describe your thoughts or perceptions about the current effectiveness of the remote learning.

Week 7:

1. Describe your experiences this week.
2. Describe your instruction this week and any changes or modifications from last week.
3. Describe how you connected with your students this week.
4. Describe the level of participation/engagement from your students this week.
5. Describe the communication between you and parents/caregivers this week.
6. What are your 'next steps' for this coming week? Any changes or adjustments?

Week 8:

1. Describe your experiences this week.
2. Reflect on your science instruction in the classroom and your science instruction through remote learning.
 - a. What are the similarities and differences?
 - b. What adjustments or modifications have you made for remote learning?
3. Describe how you connected with your students this week
4. Describe the level of participation/engagement from your students this week.
5. Describe the communication between you and parents/caregivers this week.
6. What are your 'next steps' for this coming week? Any changes or adjustments?

Week 9 – Final Spring Interview

1. What are your thoughts and reactions about your experiences with remote instruction?
2. What were the highlights of this experience?
3. What were your biggest obstacles during the experience?
4. What did you learn about yourself and your instructional practices during this experience?
5. What did you learn about your students during this experience?
6. How will this experience influence your instructional practices in the classroom?
7. Do you feel you were prepared to administer instruction through remote/alternate methods of instruction?
8. What could be done in the future to better prepare TEACHERS for this type of experience?
9. What could be done in the future to better prepare STUDENTS for this type of experience?
10. What could be done in the future to better prepare PARENTS for this type of experience?

Fall Follow-Up Interview

1. Any changes in what or where you are teaching this year; has your role changed since May?
2. How did your district transition back to school? (remote start/on-site/combination of options) When did you start school?
3. Describe your experiences starting school this fall.
4. How do you plan to address gaps in student learning from the spring?
5. Describe your current science instruction. (frequency, duration, what the instruction involves, etc.)
6. How will you be addressing gaps in student's science learning from the spring?
7. How has the remote learning experience influenced your instruction this fall?
8. How do you think the remote learning experience during the COVID-19 pandemic will impact the future of education?