

THE IMPACT OF THE RAPID SHIFT TO REMOTE AND HYBRID INSTRUCTION
ON THE TEACHER DISPOSITIONS OF K-6 PUBLIC SCHOOL TEACHERS
DURING THE COVID-19 PANDEMIC

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ABSTRACT

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VERONICA ORTEGA

The global pandemic of the coronavirus disease 2019 (COVID-19) prompted an enormous disruption in day-to-day activities worldwide that initiated swift and unprecedented changes. Teacher beliefs played a prominent role in technology integration. The specific problem was that the impact of the COVID-19 pandemic upon teacher dispositions toward technology integration had not been established, such that school administrators, policymakers, and teacher preparedness programs could best support teachers and students. The purpose of this qualitative case study was to explore the perceived impact of the rapid shift to remote and hybrid instruction on the teacher dispositions of K-6 public school teachers providing remote and/or in-person instruction toward technology integration during the ongoing COVID-19 pandemic in Arizona. This qualitative case study included interviews with fifteen teachers at a single school district regarding the impact of the rapid shift to remote and hybrid learning. This study asked, “How has the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching?”

Keywords: dispositions, remote learning, hybrid learning, self-efficacy

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“The end of all education should surely be service to others.”

~Cesar Chavez

This journey began with a spark of interest and a conversation with a wise man who believed in me, and I believed him.

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Dedication

This dissertation is dedicated to my dad, with love.

Chapter 1: Introduction

The global pandemic of the coronavirus disease 2019 (COVID-19) had prompted an enormous disruption in day-to-day activities worldwide that initiated swift and unprecedented changes (Rettner, 2020; Van Kessel et al., 2021). To reduce the spread of the COVID-19 pandemic, many governments took drastic measures to restrict social movement, and as a result, many people began to work from home (Richter, 2020; Guyot & Sawhill, 2020; Cross, 2020; Bick et al., 2020). The beginning of restrictions in the United States (U.S.) started with a nationwide emergency declaration on March 13, 2020. Shortly after, on March 15, 2020, states began to shut down along with public schools in New York City (Centers for Disease Control and Prevention, 2022). Schools shutting down nationwide would be the agent that provoked significant changes in U.S. public education.

The closure of schools due to the pandemic resulted in the widespread adoption of emergency remote teaching (Crompton et al., 2021; Li and Lalani, 2020; Office of Ed Tech., 2020). For several schools, emergency remote teaching addressed the goal of continuing U.S. public school education during the pandemic. Building off a history of “distance learning,” emergency remote teaching “became a lifeline for education...” (Schleicher, 2020). Already in 2005, Kim and Bagaka suggested there had been an increase in technology access. Although there has been a progressive increase of access and use over the last two decades in U.S. schools, students have had varying learning experiences.

With the pandemic as the catalyst for remote learning, public education had seen a surge in various software and applications (CB Insights, 2020; De' et al., 2020; Singer, 2021; Sydow, 2020). The demand for video conferencing tools had increased significantly, and the implementation of video conferencing in education was the first experience for most teachers in

primary and secondary schools (Orhan & Beyhan, 2020). Additionally, many software companies responded by offering free software and product features to accommodate the growing demands for resources while working from home (Molla, 2020).

The need for technology hardware tools had substantially increased (Novet, 2020; Poletti, 2020; Pressman, 2021). Schools opted to amplify their hardware supplies by engaging in a surge of purchases through available funding (Slavin & Storey, 2020). More than ever, the use of one-to-one technology devices had become the standard out of necessity to provide access to individual students. However, using one device per student was not an entirely new concept. One-to-one devices have been in use in public schools throughout the U.S. Apple launched Apple Classrooms of Tomorrow (ACOT) in 1985, and some classrooms became fully equipped with computers and constant access to technology (Dwyer et al, 1990).

To address student education needs during the pandemic, one-to-one digital device access for student technology use at home was in demand (Andrade, 2021; O'Scanail, 2020). Internet access was crucial for device utilization at home in joining students with their instructors and classmates. Nevertheless, not all U.S. students had home internet accessibility before the pandemic. 12% of teachers reported that most students did not have a computer at home or internet access. These teachers were more likely to serve minority students or work in Title I schools (Vega & Robb, 2019).

The issues of digital inequalities have existed for years preceding the pandemic (Anderson & Perrin, 2018; Roese, 2021). There are different levels of the digital divide that explain the digital inequality disparities. The first level digital divide is the gap between people who have and do not have access to communication and information technology. This access can include computers, smartphones, hardware, software, or internet access (Van Dijk, 2017). The

second-level digital divide pertains to how people use the internet to retrieve information (Hargittai, 2002), and the third-level digital divide entails contrasts in the outcomes of internet usage within groups of users who exhibit equivalent usage profiles and access (Van Deursen & Helsper, 2015).

Background of the Problem

Teacher beliefs play a prominent role in technology integration (Najdabbasi & Pedaste, 2014). “Technologies change rapidly, requiring continual upgrading of knowledge and skills. Teachers’ belief in their efficacy affect their receptivity to, and adoption of, educational technologies” (Bandura, 2007, p. 241). Bandura (1997) indicated perceived self-efficacy is “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (p. 3). Creating a learning environment for cognitive development is heavily influenced by teacher self-efficacy. Teachers with high instructional efficacy believe students are teachable with the appropriate instructional techniques and through effective teaching can overcome negative outside influences (Bandura, 1997).

Research has found that teachers play a highly influential role on their students (Brooks, 2021) and have a powerful impact on student intellectual development through teacher expectations (Rosenthal & Jacobson, 1968). Skillful educators aim to encourage their students to master and enhance their self-efficacy in learning and set practical and challenging tasks for students (Hattie, 2003). Teaching with one-to-one technology demands noteworthy transformations for individuals and people with an expectation for all to be devoted to development and advancement. Success in the classroom relies more than ever on the teacher's skill, ambition, and aptitudes (Edwards, 2012). Additionally, there is widespread consensus among leaders in educational technology that, due to a myriad of barriers, teachers often fall

short of capitalizing on the academic potential offered by technology resources (Brinkerhoff, 2006). For many years technologies have been foreshadowed as having the potential to significantly impact teaching and learning (Schleicher, 2020; Office of Ed. Tech., 2017). Yet, the general problem is that most expenditures are directed toward new hardware, software, professional development, and technology access, where teacher dispositions and personal beliefs that often predict successful technology integration (Vannatta & Fordham, 2004) are not tended to.

With technology as the primary tool to communicate with students, teachers confronted some instructional adaptations to modify their practices (Barron et al., 2021). Teachers needed to take on the role of being the change agent in technology integration efforts through remote learning. Although many schools in the U.S. have had access to technology tools and applications, access to these tools did not serve as an indicator of technology use. Teachers, not the tools in themselves, impact technology use. Fisher (2006) warned against seeing technology as a change agent. Instead, it is the person that needs to assume the role of the agent of change. In fact, an indicator of the likelihood of teacher technology utilization is when educators approach technology professional development with a perspective that is open-minded to changes and they place a commitment to using their time further to explore technology (Vannatta & Fordham, 2004).

Assumptions have been made that having access to technology alone would change teaching and learning. As teachers faced shifts in technology use, research suggested that teachers' self-efficacy beliefs impact technology integration practices (Albion, 1999).

Statement of the Problem

The specific problem of the impact of the COVID-19 pandemic upon teacher dispositions toward technology integration had not been established, such that school administrators, policymakers, and teacher preparedness programs could best support teachers and students. Researchers know that teacher dispositions can be malleable to develop over time (Diez, 2006). Trust and Whalen (2020) suggested evaluating how teachers use technology for emergency remote teaching. What was not known were the effects of technology integration during the pandemic, nor did practitioners and scholars know the additional support, professional development, and preparation teachers needed to improve teaching and learning with technology. Kim et al. (2013) suggested that further research should investigate teacher beliefs and changes in technology integration practices.

Researchers have pointed out that there had been an ongoing need to explore the implications of specific teacher beliefs and attitudes that impacted professional growth and development (Guskey, 2002), but those specific teacher beliefs and attitudes that impacted professional growth and development based on remote and hybrid in-person experiences during the pandemic were still unknown.

Researchers wanted further research regarding the outcomes of the pandemic and technology integration in public schools to prepare educators and those that serve them sufficiently for the future. Technology scholars were being summoned to examine the impact of educators' extensive proliferation of digital technologies (Williamson et al., 2020). The effects of teaching during the pandemic in a remote or in-person setting and designing synchronous or asynchronous components for a learning environment were unknown.

Additionally, this study can provide insight into future emergency preparedness for situations when teachers and students cannot meet face-to-face or in person, such as natural disasters or health reasons. Furthermore, results from this study can help guide educational leaders' hiring practices, and teacher preparation programs in training teachers to address long-term technology integration goals and efforts that help foster teacher dispositions.

Purpose of the Study

The purpose of this qualitative case study was to explore the perceived impact of the rapid shift to remote and hybrid instruction on the teacher dispositions of K-6 public school teachers providing remote and/or in-person instruction toward technology integration during the ongoing COVID-19 pandemic in Arizona. This study was conducted in a single school district interviewing teachers from multiple schools. This study explored the impact of the rapid shift to remote and hybrid instruction at an urban school district consisting of more than half the teacher and student population as Hispanic/Latino.

Research Question

This study addressed the following research question:

RQ1. How has the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching?

Theoretical Framework

This study used the TPACK framework as its theoretical framework. The TPACK framework was developed by Matthew J. Koehler and Punya Mishra building on Lee Shulman's pedagogical content knowledge framework as a way to view teacher integration of technology in their pedagogy (Mishra & Koehler, 2006). The TPACK framework has three core components that interplay among one another. First content knowledge, second pedagogy, and finally

technology (Mishra & Koehler, 2006). This framework is discussed in greater detail in chapter two.

Research Design

This case study involved interviews with approximately fifteen teachers regarding their dispositions toward technology integration in remote and/or hybrid instruction during the COVID-19 pandemic. The following procedures guided this research. The researcher contacted the school leadership team to express interest in conducting interviews with school staff and to request to attend a staff meeting to introduce and request participation in the study. Recruited teachers engaged in approximately one-hour interviews. Audio recordings were professionally transcribed, and the interview data was analyzed through thematic analysis (Guest, et al., 2011)

Limitations

This study had numerous limitations. First, the informants from this study were teachers from one school district and a select number of schools. This means information was limited to selected school sites. Second, teachers who agreed to be interviewed in the study taught in a K-6 setting but may not have been teaching these grade levels during the time of the interview. Third, the participants came from various levels of education (potentially ranging from a bachelor's degree to doctorate degree) and experience in the amount of years teaching. Fourth, the data was collected approximately two years after the onset of remote and/or hybrid instruction. Fifth, the amount of interview time allotted could have affected the responses provided by the teacher and the time of day may have affected the teacher to focus on responses to the researcher, whether it be before, during, or after school hours. Finally, only one researcher analyzed interview data. This limited the data to the understanding of the researcher and the researchers' biases operating under the guidance of data collection and analysis procedures espoused by published experts.

Description of Terms

Teacher Dispositions. Teacher dispositions refers to a person's tendencies based on beliefs and values to act in a certain way under specific circumstances (Villegas, 2007).

Remote Learning. Remote learning is when the learner and teacher are divided by time and space. Information is regularly conveyed through technology, and remote learning can occur either asynchronously or synchronously (Remote Learning, 2020).

Hybrid Instruction. Hybrid instruction includes the integration of traditional school attendance and online instruction (Tritsch, 2021).

Distance Learning. Distance learning consists of learning materials through “posts or via digital channels”. The design is available in sequential order and moves toward summative assessment. It focuses on the learner being able to take in and obtain knowledge from the resources available (Greener, 2021).

Online Learning. Online learning requires interaction between other learners and/or the teacher while also providing digital course content that was designed with pedagogy in mind (Greener, 2021).

Technology Integration. “Technology integration is the process of teaching technology (technology education) and another curricular area simultaneously. In addition, it is the process of using technology to enhance teaching for learning (educational technology)” (EdTech Connect, 1999, as cited in Schmitt, 2002).

Emergency Remote Teaching. Emergency remote teaching (ERT), defined by Hodges et al., (2020) is a provisional shift of instructional delivery to an alternate delivery method due to emergency occurrences.

Organization of Dissertation

This dissertation is organized into five chapters. Chapter one presents the introduction to the research. Chapter two summarizes a review of the literature. Chapter three details the research design and methodology. Chapter four presents the research results, and chapter five provides the summary of the research, implications, and conclusions.

Summary

The onset of the COVID-19 pandemic had changed the way in which students were educated, from in person to a remote and/or hybrid setting. This chapter provided the background to the problem, purpose of the study, research question, theoretical framework, limitations, and description of terms.

Chapter two provides an overview of technology integration, the theoretical framework of the study, an overview of remote and hybrid instruction, teacher dispositions, and the COVID-19 Pandemic.

Chapter 2: Review of the Literature

Concerning the previously mentioned problem and study purpose, an initial review of the literature was conducted regarding (1) technology integration, (2) remote and hybrid instruction, (3) teacher dispositions, and (4) the COVID-19 pandemic.

Technology Integration

The following is a brief overview of technology integration from the history of technology tools, technology reform, and theoretical approaches to technology integration.

History of Technology Tools

The history of technology tools has progressed significantly from the early tools in education to the present day. The early technology tools in schools began with chalkboards. The idea and use of chalkboards became popular in U.S. Schools in the 19th century (Erasing History, 2002; Gershon, 2017; Karpf, 2012; Krause, 2000). From the relative beginning, chalkboards were mostly accepted and considerably praised (Krause, 2000). The chalkboard had remained in classrooms for many years, but eventually, many schools converted to whiteboards (Brownridge, 2020; Erasing History, 2002). Through the Apple Classrooms of Tomorrow (ACOT) research project in 1985, computers would enter classrooms to examine their impact on teaching and learning (Dwyer et al., 1990). The ACOT research project was also the first one-to-one access large-scale endeavor in a K-12 environment for teachers and students (Donovan et al., 2007). ACOT also provided additional hardware and software to various school classrooms throughout the U.S. (Niederhauser & Stoddart, 2001). As schools began to invest more money in purchasing computers, labs were utilized to provide equity for the entire school to access technology (Budin, 1999). By 2000, E-Rate, a government subsidy, had increased internet access

in schools (Goolsbee & Guryan, 2006). The following information will provide a more in-depth perspective into the history of educational technology tools.

Ancient Roots of the Chalkboard. The first recorded use of technology in the classroom was small erasable slates to be used by individual users. Later, these small slates would be used as connected slates to show a larger representation of information to a larger audience (Buzbee, 2014). Afterward, the blackboard came into use. From the outset, its use was widely embraced, accepted, and appreciated (Krause, 2000). The traditional color of blackboards was changed to green porcelain, and the term chalkboard became more commonly used. Chalkboards and slates were cleaned with rags and later erasers (Buzbee, 2014). The chalkboard was introduced in the early nineteenth century (Gershon, 2017), and it has been a significant point of focus in classrooms for approximately 200 years (Brownridge, 2020). Students were encouraged to share their attention between the chalkboard and their personal desk space of learning materials (Karpf, 2012). Technology tools advanced through the centuries. A notable technological revolution did not occur again in the classroom until the 1970's and 1980's.

Classroom Technology through the 18th-19th Century. During the 18th and 19th century there was a transformation in how education was shared and delivered through distance. Advanced technology developments during this time later played a part in educational media technologies. Correspondence learning courses emerged in the early 1700's through the use of the U.S. Postal System. Students and educators would exchange assignments and other educational information in a time where postal services were slow and did not consist of a regular delivery system (Harper et al, 2004). The discovery of animation came in the 1800's and by the middle of the 1800's photography was invented and later in the century came motion pictures (Palmer, 2003). These types of media would later be used within schools for educational

purposes. Although there were not revolutionary advancements in the classroom during this time, the technologies and delivery methods developed would lead to a pathway of future computer use in educational technology.

Apple Classrooms of Tomorrow. The 1980's was an exploration of access to computers in classrooms. In 1985, a collaboration between Apple Classrooms of Tomorrow (ACOT) and public-school districts from around the country studied the potential impacts in teaching and in learning through teacher and student routine use of technology. ACOT's were provided with continuous access to computers and additional hardware such as printers, scanners, video players, CD-ROM drives, and access to software resources (Dwyer et al, 1990). There was a strong focus on innovation during this period and less on instruction and assessment. As a result, student learning tasks somewhat remained intact. However, new teaching and learning behavior appeared at schools equipped with technology (Dwyer et al, 1990). A study was conducted to see the effects of student use of technology and the notion that it could promote empowered learning. It was found that student empowerment, consisting of students' own view of self-control and personal responsibility for their learning, increased when learners could make decisions on the class activities and assignments that would allow them to develop or alter their work (Fisher, 1989).

The Rise of Computer Labs and Educational Software. From the 1980's forward, rooms of computers became a staple inside public schools in the United States. The lab was considered a solution to the school issue of staff having anxiety or little knowledge in dealing with technology. In this aspect, the lab would have its designated teaching staff. One issue that arose from this was the difficulty of ensuring a separate class period for technology in a school

schedule that was already packed. Another problem was dividing the computer curriculum from the remainder of the daily curriculum (Budin, 1999).

Consequently, there had been calls to shift away from labs and toward technology integration. Nevertheless, several difficulties with this idea included the deficiency of quality academic computer programs, computer literate teachers, and reflective integration to attain academic goals (Maddux, 1991). During this period, the major emphasis was on computer operations, and applications, computer hardware and software, computer terms and concepts, and computer-based education focused on drill and practice (Scheffler, 1999). There was no accurate count on how many computers were located in schools nationwide and if they were used to aid teaching and learning. However, in 1988 the United States Office of Technology Assessment obtained data from three large scale surveys concluding the number of computers in American public schools was between 1.2 and 1.7 million. This was an estimate of one computer device for approximately every 30 students. This estimate was determined as misleading since not all devices at this time were distributed equally among all educational institutions. (Maddux, 1991).

The development of educational software was drawn from a variety of instructional approaches. Further, theoretical orientations in behaviorist theory as well as emphasis on accountability shaped the development of various educational software packages (Stoddart & Niederhauser, 1993). It was discovered that educators who were more receptive to constructivist principles had a higher chance of selecting open-ended exploration software than software containing drills and practice (Dwyer, 1994).

There were various perspectives on why the promised computer revolution was not being fulfilled, such as experts indicating a lack of quality software and inadequate funding for both software and hardware. One of the biggest obstacles was teacher fears and lack of knowledge

about computers, especially when computers were considered outside teacher responsibilities. There was a lingering question of why teachers should know anything about computers (Budin, 1999).

Dawn of the Internet. Prior to the expansion of the internet, for public use, it was used by U.S. scientists for military research as early as the 1960's. In the 1990's, individuals were introduced to the internet worldwide due to expanded availability of network connections as well as individual computer accessibility. The internet has been referred to as the information superhighway. The expansion of the world wide web to what we call the internet today is considered one of the most critical technological innovations since the computer (Santoro, 1994). Due to the rise of the internet, and the expansion of the digital divide caused by inequality associated with the understanding of technology as well as access across income and racial lines, policymakers became concerned about long-term economic inequalities. These economic inequalities led to a universal service fund called E-Rate that would finance the internet and invest in communication technology with well over \$2 billion per year. It was thought to be the most ambitious federal technology program in schools. The funding was allocated disproportionately to low-internet schools and was deemed triumphant in closing the internet access digital divide (Goolsbee & Guryan, 2006). Although E-Rate substantially assisted in providing internet access to schools that did not have access, the digital divide still existed. Some schools had insufficient human and financial resources that prevented them from applying for funds in a timely way. Additionally, questions or concerns still remained about the effective use of technology for teaching and learning, underused computers, lack of technological savvy teachers, lack of technical support, and the development of curricula that integrates technology for educational purposes (Park et al., 2007)

One-to-One Technology. One-to-one technology has existed in the classroom since the early 1980's with the introduction of ACOT. One-to-one computing access initiatives evolved intending to implement portable computers in the learning environment. An example of an extensive scale of this was the 1996 Microsoft Anytime Anywhere Learning (AAL) initiative that helped establish a foundation for future one-to-one computing programs (Donovan et al., 2007). Most studies on laptop implementation indicated that teachers were adjusting their customary instructional routines to integrate laptops into students' learning experiences to work in small groups or independently (Penuel, 2006).

By March of 2000, the Governor of Maine announced that every seventh grader in the state would be provided with a portable wireless computing device. A state budget surplus provided him with an opportunity to improve education and the economy. During a conversation with the Logo developer, Seymour Papert, the governor was convinced that the power of technology integration would occur through the implementation of one-to-one computing. There were other large-scale initiatives throughout the U.S., but this initiative was the first statewide initiative of its kind. In the bid for computers, Apple won and agreed to provide laptops, software, wireless networks, training for teachers, and technical support (Muir et al., 2004).

Looking back at the implementation of technology tools provides a better understanding of technology trends during specific periods and how it has led to today. Another vital factor to consider while examining the history of technology is understanding the role and impact of technology from the view of educational reform.

Technology Reform

One of the most significant reforms in the public education system was signed by President Lyndon Baines Johnson in 1965, called the Elementary and Secondary Education Act

(ESEA), and it served as a civil rights law (U.S. Department of Education, n.d.). ESEA provided grants for disadvantaged low-income students to turn around and improve the quality of education. In amending ESEA, the No Child Left Behind (NCLB) Act of 2001 was signed into law by President George W. Bush, and it was deemed a milestone to reform and to improve student achievement in kindergarten through twelfth grade in U.S. schools (U.S. Department of Education, n.d; and U.S. Department of Education, 2005).

President Barack Obama signed a reauthorization of ESEA, called the Every Student Succeeds Act (ESSA), on December 10, 2015, as a commitment to all students to provide equal opportunities in American schools (U.S. Department of Education, n.d). In efforts to align with and support the principles of ESSA, the National Educational Technology Plan (NETP) was developed as a policy document that supports and acknowledges the need for equity in access to technology and for transformational learning experiences that can be facilitated through the use of technology (National Educational Technology Plan, 2021).

Meanwhile, there was not only reform through the reauthorization of ESEA over the years. Reform was supported by implementing teaching and learning standards that supported technology integration. Before NCLB, few states had standards to assess student achievement and academic progress. With NCLB being enacted as a new law, states turned to the International Society for Technology in Education (ISTE) and the standards it created in 1998 called the National Educational Technology Standards (NETS) (Knezek, 2003). The technology standards in 1998 were created to support teaching with a focus on how to use computer technology in order to access the internet during a time of predominant computer lab use. Additionally, in 2007, the technology standards were updated to focus on using technology to learn (Sykora, 2015). In 2016, the standards were revised to use technology for transformative

learning (ISTE Standards: Students, 2021). The following information provides a deeper overview explanation of the history of educational reform.

Elementary and Secondary Education Act. The creation and passage of ESEA was considered an excellent triumph for American education. Lyndon Johnson indicated that the American people's taxes would help them support themselves with fundamental education as the number one priority (Johnson, 1965). The federal monies distributed to state education officials to assist local school districts were directed toward educationally deprived students. The monies were to be allocated to textbooks and school libraries (McAndrews & Scott, 2002). ESEA Title I grants were issued to states and school districts to help improve low-performing schools, teacher quality and boost options for parents (U.S. Department of Education, 2005).

No Child Left Behind and Technology. ESEA was reauthorized through NCLB. NCLB was written with a commitment to improving student achievement with technology. President Bush indicated that NCLB was the cornerstone of his administration, and too many disadvantaged students were being left behind. At this point and time, states and local schools obtained more national allocations than previously due to NCLB (U.S. Department of Education, 2005). NCLB had measures that exposed student achievement gaps. During this time there was a focus on accountability and ensuring quality education for all students, although challenges came to the surface in implementing this goal (U.S. Department of Education, n.d.). In exchange for a greater demand for accountability, NCLB regulations provided flexibility in using federal funds. Schools were prompted to use the money for technology training, professional development, and educator retention (Jorgensen & Hoffmann, 2003).

International Standards for Technology Integration. Before NCLB, many states did not have standards to assess student achievement and academic progress. Many states turned to

the International Society for Technology in Education (ISTE) to comply with the new technical regulations. To encourage technology literacy, ISTE released the National Educational Technology Standards (NETS) in 1998 (Knezek, 2003). In 1998, the original standards were released to guide internet use and provided standards on how to teach students to use technology during the computer lab period. Later, standards released in 2007 focused on using technology to learn. During this time, mobile cart use was widespread with lessons or unit plans in the classroom. Later, there were additional changes to the standards. With a growing number of one-to-one schools and accessibility to devices throughout the school day, the priority was on technology-powered pedagogy as opposed to a focus on the technology tools in themselves (Sykora, 2015). The 2016 standards were revised to use technology for transformative learning (ISTE Standards: Students, 2021). ISTE Standards emphasize pedagogy at the core to transform learning, rather than the use of digital tools in themselves as a catalyst for transformation of teaching and learning (ISTE, 2016).

ESSA and Technology. ESSA reaffirmed the commitment that was started by ESEA but emphasized using technology to transform learning in U.S. public schools. In 2016, the U.S. Department of Education released some guidance, the Student Support and Academic Enrichment (SSAE) grant. The focus was on activities that supported education that was well rounded, the promotion of safe and healthy students, and using technology effectively. There were several technology goals to improve effective use. Goals contained quality professional development, constructing technological capacity and infrastructure, blended learning assignments, supplying rural, secluded, underserved locations with digital opportunities of increased quality, and being provided with rigorous scholarly studies and technology curricula, including technologies for digital learning along with assistive technology (Thomas, 2016).

States and districts were also to include assistive technology as part of their educational plan, and it was considered an essential element to personalize learning to support students with disabilities on assessments and daily instruction (Reynolds et al., 2016). Digital learning, as defined by ESSA (2015), is “any instructional practice that effectively uses technology to strengthen a student’s learning experience and encompasses a wide spectrum of tools and practices” (SEC. 4102).

National Educational Technology Plan. The NETP aligned with ESSA to support the effective use of technology. The NETP is an educational technology document for the U.S., and it communicates a collaborative vision of active use, equity, and leadership (National Educational Technology Plan, 2021). Key ideas and recommendations in the plan include examples of the transformation possible through the effective use of technology. Within the document, there are actionable recommendations to implement technology and conduct research to advance technology through effective use to support teaching and learning. The primary audience of this document is teachers and local, state, and federal policymakers, along with teacher preparation programs. The focus of the NETP is to provide a greater level of equity and accessibility as well as provide a shared concept and strategy to reply to a national priority. It provides action plans that exist to ensure learners have opportunities for personal growth and prospects to maintain a global economy of competitiveness (Thomas, 2016).

A summary of the history of U.S. educational reform assists with an explanation of the implementation of technology in schools. Another essential factor to consider when analyzing technology integration is theoretical approaches to technology integration.

Theoretical Approaches to Technology Integration

A variety of theoretical approaches were developed to address effective technology integration. The different perspectives of approaches include: Substitution Augmentation, Modification, Redefinition Model Framework (SAMR); the Technology Integration Matrix (TIM); Extend, Enhance, Engage (Triple E) Framework; Passive, Interactive, Creative, Replaces, Amplifies, Transforms (PICRAT) Matrix; and Technological Pedagogical Content Knowledge (TPACK) framework;

SAMR. Ruben Puentedura created the SAMR Model as a hierarchical classification schema to describe technology integration levels in the classroom. The acronym of SAMR proposes four levels: substitution, augmentation, modification, and redefinition (Svrcek et al., 2022). Substitution is the act of technology being a direct substitution tool with no changes in function. Augmentation acts the same as substitution but with a functional improvement. Modification allows for a significant redesign of the task, and redefinition allows for a previously inconceivable creation of a new task because of technology (Puentedura, 2012). As teachers integrate technology into instruction, this model helps to determine if technology application is enhancing or transforming learning. Both substitution and augmentation serve as a technology enhancement, while modification and redefinition are a form of transformational technology use (Puentedura, 2012). Figure 1 illustrates the SAMR Model.

Figure 1

SAMR Model

SAMR Model	
Redefinition	Transformation
Modification	
Augmentation	Enhancement
Substitution	

Note. SAMR Model. Adapted image from The SAMR Model: Six Exemplars, by Dr. Ruben

Puentedura, 2012,

(http://www.hippasus.com/rrpweblog/archives/2012/08/14/SAMR_SixExemplars.pdf). License provided under CC BY-NC-SA 3.0.

Technology Integration Matrix. The TIM, developed to guide evaluating technology integration in classrooms, was created at the University of South Florida (USF) by the Florida Center for Instructional Technology (FCIT) (FCIT, 2019a). The TIM table of summary descriptors provides a framework to describe and target the learning enhancement through technology. It contains interdependent characteristics of meaningful learning environments: active, collaborative, constructive, authentic, and goal-directed. The characteristics are associated with levels of integration, including entry, adoption, adaptation, infusion, and transformation. The five levels of technology integration, with the five meaningful learning environments, create a matrix of twenty-five cells (FCIT, 2019b).

The TIM aims to provide educators, school leaders, evaluators, researchers, and professional development facilitators with a common pedagogical vocabulary. The TIM is based on a constructivist learning theory for the purpose of evaluating a lesson (FCIT, 2019a).

Figure 2

Technology Integration Matrix: Table of Summary Descriptors

The Technology Integration Matrix
Table of Summary Descriptors

The Technology Integration Matrix (TIM) provides a framework for describing and targeting the use of technology to enhance learning. The TIM incorporates five interdependent characteristics of meaningful learning environments: active, collaborative, constructive, authentic, and goal-directed. These characteristics are associated with five levels of technology integration: entry, adoption, adaptation, infusion, and transformation. Together, the five characteristics of meaningful learning environments and five levels of technology integration create a matrix of 25 cells, as illustrated below.

	ENTRY LEVEL The teacher begins to use technology tools to deliver curriculum content to students.	ADOPTION LEVEL The teacher directs students in the conventional and procedural use of technology tools.	ADAPTATION LEVEL The teacher facilitates the students' exploration and independent use of technology tools.	INFUSION LEVEL The teacher provides the learning context and the students choose the technology tools.	TRANSFORMATION LEVEL The teacher encourages the innovative use of technology tools to facilitate higher-order learning activities that may not be possible without the use of technology.
ACTIVE LEARNING Students are actively engaged in using technology as a tool rather than passively receiving information from the technology.	Active Entry Information passively received	Active Adoption Conventional, procedural use of tools	Active Adaptation Conventional independent use of tools; some student choice and exploration	Active Infusion Choice of tools and regular, self-directed use	Active Transformation Extensive and unconventional use of tools
COLLABORATIVE LEARNING Students use technology tools to collaborate with others rather than working individually at all times.	Collaborative Entry Individual student use of technology tools	Collaborative Adoption Collaborative use of tools in conventional ways	Collaborative Adaptation Collaborative use of tools; some student choice and exploration	Collaborative Infusion Choice of tools and regular use for collaboration	Collaborative Transformation Collaboration with peers, outside experts, and others in ways that may not be possible without technology
CONSTRUCTIVE LEARNING Students use technology tools to connect new information to their prior knowledge rather than to passively receive information.	Constructive Entry Information delivered to students	Constructive Adoption Guided, conventional use for building knowledge	Constructive Adaptation Independent use for building knowledge; some student choice and exploration	Constructive Infusion Choice and regular use for building knowledge	Constructive Transformation Extensive and unconventional use of technology tools to build knowledge
AUTHENTIC LEARNING Students use technology tools to link learning activities to the world beyond the instructional setting rather than working on decontextualized assignments.	Authentic Entry Technology use unrelated to the world outside of the instructional setting	Authentic Adoption Guided use in activities with some meaningful context	Authentic Adaptation Independent use in activities connected to students' lives; some student choice and exploration	Authentic Infusion Choice of tools and regular use in meaningful activities	Authentic Transformation Innovative use for higher-order learning activities connected to the world beyond the instructional setting
GOAL-DIRECTED LEARNING Students use technology tools to set goals, plan activities, monitor progress, and evaluate results rather than simply completing assignments without reflection.	Goal-Directed Entry Directions given; step-by-step task monitoring	Goal-Directed Adoption Conventional and procedural use of tools to plan or monitor	Goal-Directed Adaptation Purposeful use of tools to plan and monitor; some student choice and exploration	Goal-Directed Infusion Flexible and seamless use of tools to plan and monitor	Goal-Directed Transformation Extensive and higher-order use of tools to plan and monitor

The Technology Integration Matrix was developed by the Florida Center for Instructional Technology at the University of South Florida, College of Education. For more information, example videos, and related professional development resources, visit <http://mytechmatrix.org>. This page may be reproduced by schools and districts for professional development and pre-service instruction. All other use requires written permission from FCI. © 2005-2019 University of South Florida

Note. The Technology Integration Matrix: Table of Summary Descriptors from The Florida Center for Instructional Technology, fcit.usf.edu, 2019, (https://fcit.usf.edu/matrix/wp-content/uploads/2019/05/2019_TIM_Summary_Descriptors_Portrait_Color-US.pdf). Copyright 2005-2019 University of South Florida. Reproduced with Permission.

Triple E. The Triple E Framework created by Liz Kolb in 2011, consists of (1) engagement in the learning goals, (2) enhancement of the learning goals, and (3) extension of the learning goals. It was developed to connect educational technology research with teaching practices (Kolb, 2020a). The framework is used to evaluate how to select tools to meet learning goals and to be able to design learning experiences so the technology tools will have a productive

impact on the outcomes of student learning and achievement. Triple E provides, for student learning, and a criterion for teachers to examine when contemplating using a technology tool.

The framework was intended to assist educators in creating lessons and is a tool to bring together purposeful tool selection, instructional strategies, and learning goals. Each component of the Triple E framework is accompanied by questions teachers should consider when thinking about technology tools (Kolb, 2020a). Figure 3 illustrates three questions for each component (Kolb, 2020b).

Figure 3

Triple E Framework

Engaged Learning:

1. Does the technology allow students to **focus on the task** of the assignment or activity with less distraction (**Time on Task**)?
2. Does the technology **motivate** students to start the learning process?
3. Does the technology cause a shift in the behavior of the students, where they move from passive to **active social learners (co-use or co-engagement)**?

Enhanced Learning:

1. Does the technology tool aid students in developing or demonstrating a more sophisticated understanding of the content? (creates opportunities for creation/production over consumption)
2. Does the technology create scaffolds to make it easier to understand concepts or ideas?
3. Does the technology create paths for students to demonstrate their understanding of the learning goals in a way that they could not do with traditional tools?

Extended Learning

1. Does the technology create opportunities for students to learn outside of their typical school day?
 2. Does the technology create a bridge between school learning and everyday life experiences?
 3. Does the technology allow students to build skills, that they can use in their everyday lives?
-

Note. Triple E Framework. Adapted image from Triple E Framework, by Liz Kolb, 2020, (<https://www.tripleeframework.com/framework-models.html>). License provided under CC BY-NC 4.0.

PICRAT. The PICRAT Matrix is a theoretical model that is student-focused and pedagogy-driven. The model considers two questions teachers should consider. The first question is, “What are students doing with the technology?” PIC refers to three options to answer this question which include passive, interactive, and creative (Kimmons et al., 2020).

The second question is, “How does this use of technology impact the teacher’s pedagogy?” RAT refers to the three options to answer this second question: replacement, amplification, and transformation. Replacement transfers an existing pedagogical practice to a new medium with no improvements. In contrast, amplification is the use of technology by the teacher to improve learning outcomes and practices. The transformation level indicates that pedagogical practices are enabled because of technology (Kimmons et al., 2020). Figure 4 illustrates the matrix by Royce Kimmons (2022).

Figure 4

PICRAT Matrix

PICRAT STUDENTS' RELATIONSHIP TO TECH IS PASSIVE INTERACTIVE CREATIVE	CR	CA	CT
	IR	IA	IT
	PR	PA	PT
	TEACHER'S USE OF TECH _____ TRADITIONAL PRACTICE REPLACES AMPLIFIES TRANSFORMS R A T		

Note. PICRAT. Matrix image from PICRAT Matrix: A matrix to help guide technology integration practices, by Dr. Royce Kimmons, 2022, (<http://roycekimmons.com/tools/picrat>). License provided under CC BY 3.0 US.

Therefore, researchers understand that there are a variety of frameworks that assist with technology integration. Each framework has a different goal in mind. TPACK is a notable framework with knowledge at the heart of integration. Further, Triple E is a practical tool (Kolb, 2020a). The history of education provides examples of technologies that promised to transform education radically but ultimately did not. However, Mishra, in an interview with Terrill (2021) indicated that educators should be looking for change or disturbance that is not within education. COVID-19 has shown that in today's environment where there has been a pandemic, schools cannot always provide education delivered in person, thus making it essential to invest in educational technology (Ganimian et al., 2020). Models of technology integration assist those in the field of education to view the implementation of technology integration in a meaningful way (Kimmons, 2018). Mishra stated in an interview with Terrill (2021) that researchers will have to look closely at issues of pedagogical practice, such as the connection of how teachers teach and learning outcomes, and how educators evaluate what they teach. Scholars do not know the long-term implications of technology integration during the COVID-19 pandemic. Accordingly, this study concerns itself with technology integration, and pedagogical practice.

TPACK. This study utilized as its theoretical framework, TPACK. The TPACK framework was developed by Matthew J. Kohler and Punya Mishra building on Lee Shulman's pedagogical content knowledge framework as a way to view teacher integration of technology in their pedagogy (Mishra & Koehler, 2006). The TPACK Model has three core components that interplay among one another. First content knowledge, second pedagogy, and finally technology (Mishra & Koehler, 2006). The TPACK Framework has greatly influenced teacher professional development, the practice of teacher education, as well as research and scholarship (Mishra, 2019). Lee Shulman introduced the framework of pedagogical content knowledge (PCK) to

advance thinking about teacher knowledge. The main focus of this was to address the relationship between these two domains so they would not be isolated from one another. PCK represents the blending of the two demands. At the center of PCK is the way teaching transforms the subject matter (Mishra & Koehler, 2006). Shulman (1986) argued that PCK included a representation and formulation of the subject content that would make it possible for others to understand.

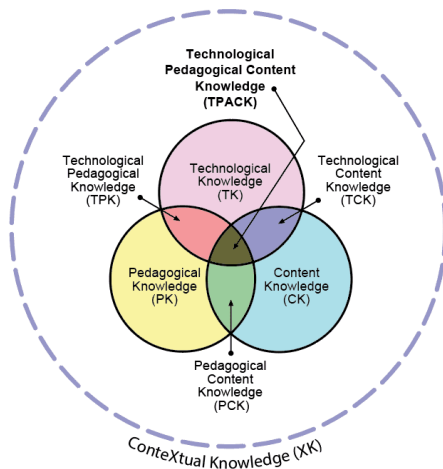
Similar to Shulman's PCK, with an intersection of two domains, TPACK (formerly known as TPCK) is a triad of knowledge that intersects with one another (Mishra & Koehler, 2006). Technological pedagogical content knowledge (TPACK) goes beyond content, pedagogy, and technology components. TPACK requires an understanding of concepts using technologies, teaching content using technologies in constructive ways through pedagogical techniques, as well as knowledge of student prior knowledge, how technologies can build on pre-existing knowledge, and how to develop new theories of knowledge or reinforce older ones (Mishra & Koehler, 2006).

The TPACK Framework contains three main knowledge bases that include: technology (T), pedagogy (P), and content knowledge (CK). It additionally has four interacting forms of knowledge: pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPACK). Further, the most recent update to the framework diagram includes the knowledge domain of contextual knowledge (XK) (Mishra, 2019).

This framework was introduced to understand the essential qualities of required teacher knowledge to integrate technology (Mishra, 2018). Figure 5 illustrates the TPACK Framework.

Figure 5

TPACK Framework



Note. Revised version of the TPACK image. © Punya Mishra, 2018. Reproduced with permission

The TPACK image has remained unchanged since 2009 despite many attempts to revise the existing model. Every enclosed space in the framework represents an aspect of teacher knowledge. The outer circle of the TPACK diagram was named contexts, which is now labeled as representing contextual knowledge (XK). XK also highlights the outer circle as representing a knowledge domain that a teacher should have while teaching through technology integration and it encompasses teachers' knowledge of the functions of their organization and how sustainable change is impacted by power and influence (Mishra, 2019). The idea of contextual knowledge is recognizing teachers work within situational and organizational constraints (Mishra, 2019).

Theoretical Framework

This study adopted its theoretical framework the technological pedagogical content knowledge (TPCK) framework as defined by Punya Mishra and Matthew J. Koehler (2006). The original acronym of TPCK has been updated to TPACK (Thompson & Mishra, 2007). The

TPACK framework has seven components divided into two overarching categories. First, the core components of TPACK are as follows: Technological knowledge (TK) is knowledge of everyday technologies. These technologies include books, chalkboards, the internet, and digital media. Pedagogical knowledge (PK) is in-depth knowledge of the practices, instruction, and learning methods. It includes educational purposes, aims, values, knowledge of learning theories, and how it applies to students. Additionally, content knowledge (CK) deals with the subject matter instructed upon or that will be retained (Mishra & Koehler, 2006).

An illustration of the TPACK components is below.

TPACK Components		
Core Components	Technology Knowledge (TK)	Contextual Knowledge (XK)
	Pedagogical Knowledge (PK)	
	Content Knowledge (CK)	
Interacting Components	Technological Pedagogical Knowledge (TPK)	
	Pedagogical Content Knowledge (PCK)	
	Technological Content Knowledge (TCK)	
	Technological Pedagogical Content Knowledge (TPACK)	

Remote and Hybrid Instruction

Before presenting contemporary research regarding emergency remote teaching, the following presents the history of remote and hybrid instruction in K-12 schools.

History of Remote and Hybrid Instruction in K-12 Schools

To facilitate learning at a distance, various technologies can promote interaction and provide feedback between the student and teacher. These technologies include printed materials,

radio broadcasting, television broadcasting, computer conferencing, email correspondence, interactive video, satellite telecommunication, and multimedia computer technology (Gunawardena & McIsaac, 2013). Distance learning sources can be traced back to the 1700's. After this time, correspondence education was a utilized method of learning. It expanded to multiple countries. Mike Erwin from the University of Advanced Technology explained it as a mail correspondence where the student would receive and respond to instructional assignments or questions. The response time from the instructor lagged and could take many weeks for a reply (Florida National University, 2019).

In 1982, to reflect the developments in distance education, the International Council for Correspondence Education changed its name to the International Council for Distance Education. New technology rapidly grew with the development of delivery information systems. These systems provided equity to access education. Nowadays, distance education is offered in many public and private school districts, universities, organizations, and the military (Gunawardena & McIsaac, 2013).

Remote and distance learning existed after 1910 as an option for music lessons through the mail (Martin, 1999). Instructional lessons were available via phonograph cylinder recordings in 1906 (Hash, 2016) through radio broadcasting use in the 1930's (Sanders, 1990) and in 1960 via educational television stations (Allen, 1966). In 1993 the University of Iowa utilized the Iowa Communications Network, a fiber-optic technology, to deliver instrument classes to public school children, allowing a two-way interactive telecommunications system between instructors and students (Simonson et al., 1997).

Today, remote learning in Primary to 12th grade may occur in schools due to weather or other conditions which would not make in-person instruction feasible. Some students may

receive a learning packet of instructions or materials they complete independently and return. In contrast, others will participate in Open and Distance Learning (Hash, 2021). Classes can be synchronous, to happen in real-time via a video conferencing platform as would be face-to-face learning. In comparison, asynchronous involves an independent student-directed approach determined by the student-directed pace of learning and place (Sleator, 2010).

Hybrid instruction includes the integration of traditional school attendance and online instruction (Tritsch, 2021). The teacher continues to provide instruction, and parents can assist in the facilitation of learning from home. Students can join remotely from a separate location or in person. Stanford University developed a video network in the 1970-80's for professors to have multiple sessions across the city of San Francisco at one time. In 1998, web-based instruction was developed, and access offered interactivity to learning materials. As time progressed into the 2000's, hybrid instruction evolved into video conferencing tools, such as tutorials and webinars, for people to learn from their instructors and peers from anywhere in the world (Tritsch, 2021).

In modern-day, remote learning is when the learner and teacher are separated by time and space. Information is usually transmitted via technology. Remote learning can occur either asynchronously or synchronously (Remote Learning, 2020). Asynchronous teaching happens anytime through a media platform, such as using discussion boards or email, while students can learn at their own pace and chosen time. Synchronous learning occurs in real-time, such as through video conferencing and chat, so educators and student learners can interact (Hrastinski, 2008). Hybrid instruction combines synchronous online learning and face-to-face instruction (Hybrid Instruction, 2021).

Emergency Remote Teaching

To slow down the COVID-19 pandemic, schools closed to ensure social distancing (Crompton et al., 2021). In the Spring of 2020, the global pandemic resulted in schools transitioning to models of remote learning for the rest of the academic school year (Hash, 2021). The COVID-19 pandemic prompted the first large-scale attempt at distance learning (Whittle et al., 2020). Regardless of whether teachers were technologically or pedagogically prepared and confident in teaching in a remote or hybrid and in person-environment, they were launched into it during the COVID-19 crisis (Gomez et al., 2021).

During the COVID-19 pandemic, teachers and administrators have encountered many challenges. They include a shift to online learning environments with diversity in technology access, parental support, and varying educational expectations (Whittle et al., 2020). Remote learning during the pandemic was essentially emergency teaching and not implementing a curriculum that had been intended for distance learning (Hash, 2021). Emergency remote teaching (ERT) was a response to the COVID-19 crisis. This ERT is a rapid development in instructional support during a crisis. It is different from preplanned online learning. Circumstances of a crisis can prompt ERT, and it is a temporary transition of instructional delivery to an alternate method of delivery. Its goal is to provide short-term instruction and instructional support that is quick and reliable during a crisis or emergency. It involves using fully remote teaching that would have been delivered face to face or as a blended or hybrid course that will eventually return to its original instructional delivery once the crisis or emergency has diminished (Hodges et al., 2020).

Emergency remote teaching is not a new concept; it has been used on a much smaller scale in the past. A large-scale grant from the Sloan Foundation assisted in creating online

courses in response to the 2005 Katrina hurricane disaster. The response from universities around the country that offered classes allowed displaced Katrina students to continue their education. This was known as the Sloan semester (ZDNet, 2006; Schroeder, 2020; Lorenzo, 2008).

Teacher Training

Teacher training for technology implementation has been a concern for many years. Ertmer (1999) indicated the lack of technology implementation due to inadequate training. Additionally, due to the number of technologies that can continuously develop throughout an educational career, there is an ongoing need for additional teacher training to maintain current technology skills (Johnson et al., 2016). The following themes are discussed related to emergency remote teaching specific to teacher training and professional development: (1) Training to ease transition, (2) lack of training, (3) and professional development related to instructional planning for teaching.

First, training to ease the transition to emergency remote teaching was in high demand. Teachers struggled with the challenges of transitioning from conventional curriculum to online-based instruction, and at the same time, teachers were not prepared or professionally trained to teach through emergency remote teaching. With the onset of COVID-19 changing the way teachers instruct, teacher training in remote learning was in disproportionately high demand. For teachers to instruct remotely they required technological and pedagogical skills for which they hadn't been adequately prepared (Wilichowski & Cobo, 2021).

Webinars were used to expand teacher training during the pandemic in the face of social distancing and quarantine. This was a way to address the challenges of remote teaching while also preventing the transmission of COVID-19. However, there is a lack of research on the

effectiveness of webinar-based training in developing pedagogical skills and knowledge (Toquero & Talidong, 2020).

Second, teachers lacked training in remote learning. As a form of professional development, teachers engaged in communities of practice. Communities of practice also play an integral role in teacher professional development because it assists in the development of teacher identity and practices (Kirkby et al., 2019). A community of practice (CoP) is a group of people who frequently collaborate in efforts to share their knowledge as well as a common goal of improving a certain area or topic (Mohajan, 2017). A CoP as a support group allows teachers to have a safe space to share their thoughts, struggles, and experiences in online and remote teaching during the pandemic. CoPs are considered a place to deal with issues, listen to narratives, and share understanding and best practices (Ulla & Perales, 2021).

Third, the literature below discusses the importance of instructional planning. ERT requires that teachers take more control of the development, design, and implementation of teaching. At the same time, professional development support staff need to assist teachers in developing skills to teach online (Barbour et al., 2020). Barbour (2010) explains the importance of planning for remote learning by explaining Singapore teacher education programs require that teachers complete a course about teaching online and virtually because of the week-long school closure in preparation for natural disasters or in preparation for a pandemic. Despite preparation efforts by Singapore, access to devices was an issue for disadvantaged students. It was recognized that these students were most affected during the school closure from lack of personal learning devices (Balakrishnan, 2020). During the COVID-19 pandemic, it was suggested that at the start of the 2021 school year, schools should move past EMT to plan for a more prepared experience of online learning (Barbour et al., 2020).

Digital Divide

Teachers have been expected to use technology in schools to enrich student education. Although using technology has been a significant concept in education, it has also highlighted some challenges (Johnson et al., 2016). Some of these challenges are explained by understanding the various levels of the digital divide.

In the 1990's, social inequality grew between people who had access to information and communication technology (ICT) resources and those who did not. This social inequality was known as the digital divide. This definition has expanded over time to mean more than just obtaining access to these ICT resources but includes the fact that people have the skills, knowledge, and dispositions to be able to improve their lives through the use of ICT resources (Ritzhaupt & Hohlfeld, 2018). Scholars provided a closer look at the various levels of the digital divide. Hohlfeld et al. (2008) describes the levels of the digital divide in terms of educator focus. The first level they describe of the digital divide is a technological infrastructure within a school, such as equitable access to software, hardware, the internet, and technology support. At this level educators are solely interested in having access to resources while ignoring the way in which these resources are used. In contrast, the second level digital divide is determined based on meeting the requirements of the first level divide. The second level is measured by the use of the different types of technologies, the purpose, and the level of integration in daily practices for delivering the curriculum. At this level educators are aware of the educational purpose of using the technology. The third level applies to student technological skills and the capacity to make decisions independently to select and appropriately use the information and communications technology to accomplish their pursuits efficiently. This level focuses on the student and how they are able to independently utilize technology to improve their everyday lives.

Analysis of computer and online access within the U.S. were provided in data reports on access by the user's income, geographic location, age, and education level (National Telecommunications and Information Administration, 1995). As the reports took a look at users with a variety of backgrounds, scholars continued to explain the critical importance of having access to ICT. Warschauer (2004) indicated that being connected is of great importance in many ways in today's lifestyle including for those in education, government, civics, culture, entertainment, and through personal exchanges.

Hargittai (2002) proposed the need to view who uses the internet and analyze the combination of levels of individuals' online skills. These skills refer to the ability to effectively and efficiently find information via the world wide web. As the web spreads to many Americans, it can be determined if there is a second-level digital divide through exploration of how retrieval of knowledge is used. Kim and Kim (2001) described that to separate the digital divide, a user needs to be able to use ICT to improve their quality of life rather than only have access to information technology devices. An example of this is when technology can be used as a learning tool to improve a real-life outcome, rather than passive use of consuming information with no real life influence.

Van Deursen and Helsper (2015) explained the third-level digital divide related to internet users with similar usage and easy access to information and communication technologies and internet infrastructures. However, these users have disparities in return from internet use. This relates to gaps in an individual's capacity to reflect promising offline outcomes. For example, a student may search for information on how to resolve issues in their everyday life. This can include but is not limited to completing a resume, creating a portfolio for a job

interview, learning how to use a new software system, etc. These are all examples of how technology can influence use and a positive outcome to achieve a goal.

Hohlfeld et al. (2008) indicated the importance of addressing the three levels of the digital divide is dependent on the first and second levels being addressed. Having access to various hardware and software tools is the first step toward teachers modeling appropriate technology uses, thus leading to students obtaining the necessary competencies to enhance their future academic path. In order to address the three levels of the digital divide, schools need to have an infrastructure for the attainment and maintenance of software, hardware, and additional technical support. Additionally, provide ongoing professional development to sustain practical ICT skills for daily instructional use. Also, ensuring partnership with families or caregivers have access to technology and training to guarantee students have equitable instructional experiences. It is also important to confirm collaboration with the government, community organizations, and schools. This will assist in providing internet and computer access that supports the educational process to participate fully and optimize the utilization of information and communication technology. This will aid in developing skills that will empower them to make choices for an improved quality of life.

The gaps in the digital divide in many U.S. schools became even more evident at the onset of the closure of schools. During a news interview, Mishra (as cited in Terrill, 2021) indicated the pandemic had affected the disadvantaged more than the privileged, which made equity gaps in the field of education more evident along with the problems in our society that deal with gaps in equity, wealth, and education. Additionally, with the need for remote learning, educational technology has been a topic of discussion in schools. It indicates that researchers will need to deal with the issues that resulted from the pandemic.

Teacher Dispositions

Teacher education programs, education authorities, and local school districts utilize different words to describe “teacher dispositions.” The attitudes of teachers are discussed under different names, including “teacher dispositions,” “teacher characteristics,” “teacher mindset,” and other associated terms. For this paper, “teacher dispositions” refers to a person's tendencies based on beliefs and values to act in a certain way under specific circumstances (Villegas, 2007). This section explores the varying views on teacher dispositions and their function.

Historical Approaches to Teacher Dispositions

There is a long history associating teacher expectations with student outcomes. There have been various definitions of teacher dispositions. Fonseca-Chacana (2019) indicates there is no single definition of teacher dispositions. The definition used by a program should be consistent with the professional community's values (Carroll, 2007; Cummins & Asempapa, 2013; Shiveley & Misco, 2010). The definition that is not consistently defined, would have a consistent definition within the community in which it is being used as well as the use of the definition being consistent with the importance, worth, or usefulness to the community. Walker (2019) also indicated no agreement on the term's meaning for defining dispositions. The following describes historical approaches to teacher dispositions.

Core Perceptions: Values, Attitudes, Beliefs. First, one body of researchers discussed teacher dispositions as core perceptions. Researchers use a variety of terms to discuss teacher dispositions. Beliefs and attitudes most often refer to what teachers believe about what works in teaching, what fails, and how their classroom, school, and district are functioning. Values often refer to what teachers believe is right, correct, or worthwhile. Villegas (2007) defined dispositions as a person's tendencies based on beliefs and values to act in a certain way under

specific circumstances. Warren (2018) indicated that a person's tendency reveals a pattern of behavior, which assists in predicting the upcoming actions of a teacher. Beliefs are judgments that are made about oneself, others, and those around us in the world (Gilakjani & Sabouri, 2017). Martin Haberman (1991) emphasized that beliefs and attitudes work together to form the values teachers will act on. These dispositions about children along with subject matter and teaching skills shape how teachers select to act on several professional tasks (Englehart et al., 2012). Wasicsko (2007) indicated dispositions as a teacher's values, beliefs, and attitudes. Core perceptions must be combined with significant knowledge and content skills to facilitate effective learning. Singh and Stoloff (2007) indicated dispositions are related to values of social justice, responsibility, honesty, fair-mindedness, and thoughtfulness that are guided by beliefs and attitudes.

From the Council of Chief State School Officers (CCSSO) disposition definition, the Interstate Teacher Assessment and Support Consortium (INTASC) standards for teacher dispositions were constructed to help teacher preparation programs assess teacher candidates and provide guidance on curriculum development (Walker, 2019). The CCSSO's InTASC (2013) defined critical teacher dispositions as the action and commitment of professional teachers that impact performance and actionable practice. Although "critical" is not defined, it may be an indication of the importance of habits of professional action in practice.

Patterns of Behavior. Second, another body of researchers discussed teacher dispositions as having behavior patterns. Katz (1993) defined dispositions as behavior patterns that are often demonstrated on their own without influence as a voluntary, intentional habit to achieving a goal. Although there have been many variations of the definition as listed in this chapter, the consistent fundamental presumption is that dispositions are guided by beliefs,

values, and attitudes and are illustrated through observable behaviors. Furthermore, if dispositions are the basis for teacher behaviors and decision-making, then the influence of those dispositions on student success is compelling (DiGiacinto et al., 2017).

Behavior patterns tend to be attributed to tendencies. Buss and Craik (1983) defined dispositions as a collection of frequent acts. Building on this definition, Katz and Rath (1985) defined dispositions as a summary of frequent acts or behavior trends. They also explain that professional dispositions are habits in the teacher's mind that facilitate the growth of skillful behavior.

Context-Based. Third, teacher dispositions are sometimes discussed in terms of context. Carroll (2012) determined that dispositions are linked with values and commitments displayed through actions. Similarly, Oja and Reiman (2007, as cited in Fonseca-Chacana, 2019) indicated that the context, experiences, and interactions influence dispositions. The situation, prior experiences of a person, and interactions all shape and develop dispositions of a person.

Teacher dispositions have many definitions that reference values, attitudes, beliefs, behavior, and the context of the situation. Many of these definitions overlap with similar concepts, as evidenced above.

Facilitating Change

By the 2000's, scholars and practitioners began focusing their efforts on reforming schools from within, focusing on teachers themselves. The following will present the literature and research about these efforts.

Teacher Disposition. As the examples provided in this chapter, authors and agencies provide competing definitions of teacher dispositions. By 2002 the National Council for Accreditation of Teacher Education (NCATE) shared its definition of teacher dispositions.

NCATE's (2002) definition refers to dispositions as:

The values, commitments, and professional ethics that influence behaviors toward students, families, colleagues, and communities and affect student learning, motivation, and development as well as the educator's professional growth. Dispositions are guided by beliefs and attitudes related to values such as caring, fairness, honesty, responsibility, and social justice. (p. 53)

In 2008, NCATE updated its definition of dispositions to:

Professional attitudes, values, and beliefs demonstrated through both verbal and non-verbal behaviors as educators interact with students, families, colleagues, and communities. These positive behaviors support student learning and development.

NCATE expects institutions to assess professional dispositions based on observable behaviors in educational settings. The two professional dispositions that NCATE expects institutions to assess are fairness and the belief that all students can learn. Based on their mission and conceptual framework, professional education units can identify, define, and operationalize additional professional dispositions. (p. 89-90)

Therefore, NCATE's definition shifted from a non-observable action to one that is observable.

Accrediting bodies have continued to develop the meaning of teacher dispositions further. In September 2014, NCATE and the Teacher Education Accreditation Council (TEAC) merged with Council for Accreditation of Educator Preparation (CAEP) (Council for Higher Education Accreditation, n.d.).

CAEP (2020) had adopted on their website the definition from the CCSSO's InTASC. The CCSSO's InTASC (2013) defines "critical dispositions" as "habits of professional action

and moral commitments that underlie the performances play a key role in how teachers do, in fact, act in practice” (p.6).

Research has primarily focused on the impact of teacher dispositions on student learning. Teacher dispositions have been determined to affect both student learning and the development of the teacher profession. Singh and Stoloff (2008) found teacher dispositions impacted three aspects of students: (1) Student learning, (2) development, and (3) motivation.

Other research has examined how teacher dispositions affect the teaching profession. Benninga et al. (2008) advocated for returning to the original purpose for which teacher dispositions were constructed: “the moral and ethical dimensions of the profession of teaching.” Benninga et al. (2008) brought to light the original intent of constructing the definition to focus on the essence of the educational profession through the lens of an educator. Therefore, regarding teacher dispositions, investigators understand that teacher dispositions are not fixed but can be developed. Scholars did not know how teacher dispositions had been affected during the pandemic of COVID-19.

Teacher Philosophy. Just as teacher dispositions became a focus of research in practice in the past twenty years, educational philosophy was also a significant concern for scholars. Fatma (2016) emphasized that a teacher's educational philosophy is a critical and active aspect of a teacher. Soccorsi (2013) elaborated on how consequential it is to develop a philosophy. It leads and steers educators teaching practices as well as how educators view their students and teaching and learning.

Fatma (2016) indicated that a philosophical perspective of education involves questioning and responding to the role and the intention of education in a society, the role of the learner as well as the educator, the function of the curriculum, and the most appropriate instructional

delivery strategies. Educational philosophy is a thinking approach that provides a viewpoint for teachers. A teacher's philosophy influences their perceptions, beliefs, knowledge, and values to the juncture where all conclusions have derived from their educational philosophy.

A personal teaching philosophy is essential for teachers, as it guides their instructional practices in their learning environment, and their perception of teaching and learning (Soccorsi, 2013). Experiences as a student and a teacher influences beliefs and attitudes on the quality of teacher and effectiveness of teaching (Sheridan & Moore, 2009). Consequently, becoming mindful of and making meaning of a philosophical perspective is critical. Additionally, if an educator endeavors to instruct for the exclusive pursuit of providing information, the instruction is not connected with broader learning outcomes and consequently provides no applicable meaning for the learner. Ryan (2008) indicated that a teacher's detailed interpretation of their teaching philosophy will assist them in developing professionally and assembling an intentional approach to teaching.

Self-Efficacy. Just as researchers were interested in teacher dispositions and philosophy, scholars were also interested in teacher self-efficacy. Over the past many decades, the definition of self-efficacy has transformed. The following presents numerous historical definitions of this term. During a time of change, teacher self-efficacy would determine teaching outcomes and, in turn, impact student self-efficacy. Bandura (1977) defined self-efficacy as a person's belief in their capacity to take action on managing and executing an undertaking or task. Self-efficacy is distinct to a certain set of behaviors. For example, a teacher may have self-efficacy related to their behaviors relating to teaching a topic. Self-Efficacy incorporates two elements, efficacy expectations and outcome expectations. That is, how well an individual perceives they will perform and how they believe the outcome will be positive. Gavora (2010) defined teacher self-

efficacy as the educator's individual belief in their capability to plan instruction and achieve instructional objectives. Henson (2001) indicated research scholars have busily consulted about teacher self-efficacy as they have focused more attention on the influence of self-efficacy on educator behavior since the 1970s.

Some research has focused on how self-efficacy influences the behavior of teachers. Baytiyeh (2018) indicates that social cognitive theory proposes that individuals need to believe they can deal effectively with possible stresses brought on by the environment. By 1997, Bandura (1997) revised his definition on self-efficacy to an individual's belief in their abilities to regulate their behavior during circumstances that influence their lives. Baytiyeh (2018) indicated that beliefs in personal efficacy would affect choices in life, resilience to hardship, and susceptibility to anxiety and unhappiness.

Finally, research has focused on how self-efficacy allows teachers to adapt to stressors. Bandura (1977b, as cited in Conner, 2012), indicated that although self-efficacy alone is not responsible for a person's behavior or success, it is a person's perceived self-efficacy that influences a person's choices; additionally perceived self-efficacy can influence a person's coping efforts that can guide to continued persistence in meeting a learning task.

Bandura (1986, as cited in Wang et al., 2004) determined four sources of information used to evaluate self-efficacy: successful accomplishments, watching the executions of other people, and verbal influences suggesting that one contains specific abilities, as well as one's mental state. Pajares (2002) indicated that the procedures of constructing and utilizing self-efficacy beliefs are instinctive. People carry out a behavior, analyze the effects of their actions, use the insight to assemble and develop beliefs about their capability to engage in future

behaviors for comparable tasks, and act in accordance with the self-beliefs that have been assembled.

Self-Regulated Learning. Self-regulated learning is when learners set goals for themselves, monitor their progress, and take action toward those goals. While facilitating change at a school or in a classroom, a teacher may set and pursue plans to improve student learning and enhance their ability as an educator. Bandura (1986, as cited in Caprara et al. 2008) presented the social cognitive theory as a way of understanding self-regulation. The framework of social cognitive theory consists of three subfunctions of self-regulation. Caprara et al. (2008) elaborated on self-regulation through the subfunctions: self-monitoring, adopting short-term goals, and exercising self-influence. First, self-monitoring incorporates observing a task and the mental and social circumstances one takes part in. Second, adopt short-term goals based on beliefs to motivate and guide efforts and strategies for addressing the challenges ahead. Third, exercising self-influence means a learner will preserve a mindset to influence the expected effects and obtain support from others. Caprara et al. (2008) described other models of self-regulation including those of Schunk and Zimmerman (1994) and Zimmerman and Schunk (1989), which have differences in models but include a form of monitoring oneself, by utilizing guides, creating goals, and self-motivation strategies.

Zimmerman (2000) described the various forms of self-regulation based on the adjustments made from feedback due to previous implementations. These include behavior, environmental, and covert self-regulation. Behavioral self-regulation consists of the strategy of observing and adjusting the process of performing toward a goal. Environmental consists of the modification or examination of the conditions or outcome of the environment. Covert self-regulation incorporates modifying and observing mental and emotional states.

During an interview with Terrill (2021), Mishra indicated that schools are “spaces for socio-emotional development, of growth of character and identity.” Mishra (as cited in Terrill 2021) also said that “Education is always contextual. It is a rich, complex domain that will always feature multiple perspectives and approaches.”

COVID-19 Pandemic

The pandemic threatened public health throughout the world, and it caused developmental global social and economic damage. Control measures included travel restrictions, venue closing, a cease to public gatherings, isolation, tracing, quarantining, etc. (Zhang & Jin, 2022). The COVID-19 pandemic affected almost every aspect of everyday life, from work and school to grocery shopping (Rettner, 2020). On March 11th, 2020, the World Health Organization (WHO) director general was concerned about the level and severity of transmission of the COVID-19 virus and determined the virus did classify as a pandemic (WHO, Director General Opening Remarks at the Media Briefing on COVID-19, 2020). “Events and locations that involve social interaction or institutional contact have been related to the development of COVID-19 clusters, including workplace interactions, religious events, festivities, health, and social care settings, and travel” (Hidalgo et al., 2022, pp. 16-17). In the same month of March 2020, many governments worldwide took action to limit the movement of their residents in order to decrease the spread of COVID-19. These restrictions temporarily closed companies deemed nonessential and propelled millions worldwide to work from home (Richter, 2020).

Schools had limited time to prepare for remote teaching. Some preparation, if possible, included students taking home books and additional items needed for studying at home, finishing

test results and reports, some staff training and preparation, division of work, and brief updates for learning technologies (Daniel, 2020).

Implications Upon Technology Integration

COVID-19 has impacted the way people utilize technology and can potentially impact the utilization of technology integration. First, COVID-19 has generally impacted the lives of American educators. McPhail (2020) indicated that COVID-19 has altered all lives, including how people interact with others, share, and learn. In each circumstance, people are confronted with attempting to decide what is most practical and how people can reconcile what they have accomplished historically with what makes sense looking forward to the future. How people arrange themselves in this attempt has importance for the evolution and expansion as a society and within their professional implementations— in the case of a teacher, teaching and educator instruction. Researchers understand that the COVID-19 pandemic has created the most extensive disturbance of education in history, affecting a global student population of 94% (Crompton et al., 2021). According to He et al. (2021), forthcoming pandemics will likely occur. While technology scholars may not be able to assist with the scientific aspect of inventing a vaccination or with immediate treatment, the assistance of knowledge, understanding, and time can benefit humanity to be better equipped for pandemics in the future. Scholars do not know some of the unpredicted consequences beyond the interruption of education caused by the COVID-19 pandemic (UNESCO, 2020, as cited in Bozkurt & Sharma, 2020).

Second, the COVID-19 pandemic has impacted the way people use educational technology. The pandemic expanded the school's spread of laptops and educational applications for millions of educators, learners, and households, which was regarded as making these resources standard academic tools (Singer, 2021).

Finally, the COVID-19 pandemic has impacted technology integration training for teachers. Beschorner & Woodward (2019 as cited in Svrcek et al., 2022) indicated that analyses performed preceding the global pandemic have suggested that numerous teachers have minimal to no professional development and technological support in distance education from their schools and districts. This void in technical training had grown more evident primarily because of the unforeseen nature of the pandemic—which had ushered teachers around the globe to dash into action to fulfill their learner's needs during an emergency (Bozkurt & Sharma, 2020, as cited in Svrcek et al., 2022).

A need remains to critically reflect on the world pivot to remote and emergency remote teaching (Williamson et al., 2020). Pokhrel and Chhetri (2021) emphasized that further investigation was needed to study effective pedagogy for online learning and teaching. Trust and Whalen (2020) illustrated challenges from the initial days of teaching during the pandemic but have called for additional research to provide better aid, preparation, and professional development.

Conclusion

Considering technology integration, researchers have recommended further research into the use of case study methodologies that could be reproduced across various demographics and geographic areas. Taking this into consideration, there was no group of teachers that escaped the influence of COVID-19 and how instruction was delivered. During this time, there were varying intensity levels, and a case study would allow teachers to tell personal stories that quantitative data would fall short of delivering (Cotton, 2021).

Concerning remote and hybrid instruction, researchers have recommended future research into the long-term effects that will continue to affect educators and students.

Researchers defined remote instruction as when the learner and teacher are divided by time and space. Information is regularly conveyed through technology, and remote learning can occur either asynchronously or synchronously (Remote Learning, 2020). Further, hybrid instruction is defined as the integration of traditional school attendance and online instruction (Tritsch, 2021). Emergency remote teaching, defined by Hodges et al., (2020) is a provisional shift of instructional delivery to an alternate delivery method due to emergency occurrences. Researchers want further information regarding lessons learned and information to prepare for future emergencies.

Regarding teacher dispositions, scholars want clarity regarding how teachers can use their dispositions to impact student learning. Scholars define teacher dispositions as teachers' values, actions, beliefs, and attitudes as they interact with others (Professional Dispositions in Education, 2022) where values are considered what is right or correct and beliefs are judgements made about one's self and others (Gilakjani & Sabouri, 2017). Research has clearly established a foundation of understanding teachers' impact on student learning, however more information is needed regarding teacher dispositions and the use of technology integration tools to further improve instruction for students.

Therefore, the purpose of this qualitative case study was to explore the perceived impact of the rapid shift to remote and hybrid instruction on the teacher dispositions of K-6 public school teachers providing remote and/or in-person instruction toward technology integration during the ongoing COVID-19 pandemic in Arizona.

Summary

Hash (2021) advised the knowledge that can be obtained by learning how teachers' experiences and approaches to circumstances of implementing remote learning can assist in

informing professional development efforts. Research has indicated that the use of a systematic model to develop well-designed and planned instruction will result in effective learning online (Branch & Dousay, 2015). In emergencies, a careful design process is not present relating to remote and hybrid teaching (Barbour et al., 2020). Scholars suggested that schools will eventually have an opportunity to examine the effectiveness of the implementation of ERT to maintain instruction. While evaluating the implementation, it is important not to view ERT as online learning. By focusing on the strengths and deficiencies of this remote undertaking, stakeholders can be equipped for the future implementation of remote teaching (Barbour et al., 2020). Singh et al. (2021) suggested there be a high level of emergency preparedness and pedagogical methods training to build relationships and create a teaching, cognitive, and social presence for online instruction. Therefore, this study asked teachers about the impact of the rapid shift to remote and hybrid teaching (Hash, 2021), gathered information that may aid in the development of a systematic design (Branch & Dousay, 2015), and examined what pedagogical methods and emergency preparedness were present related to online teaching (Singh et al, 2021).

Therefore, there has been a long history associating teacher expectations with student outcomes. The focus has adjusted to reforming schools from within, focusing on teachers themselves. This study focused on teachers' dispositions during the COVID-19 pandemic. This study explored the impact of the rapid shift to remote and hybrid instruction on the teacher dispositions of K-6 public school teachers providing remote and/or in-person instruction toward technology integration during the ongoing COVID-19 pandemic in Arizona. The study provided a closer look through the use of case study as explained by teachers' lived experiences.

This chapter looked at the literature concerning technology integration, remote and hybrid instruction, teacher dispositions, and the COVID-19 pandemic. The following chapter

presents the research design of this study. It provides information on the methodology, participants, recruitment, pilot test, data collection and analysis, as well as provides information on ethics.

Chapter 3: Research Design

The following chapter details the research design of this study. In this case study, the researcher interviewed fifteen teachers (until saturation was reached) from three public primary schools from a single school district that taught through emergency remote teaching during the initial onset of the COVID-19 pandemic. The researcher interviewed these teachers regarding the impact of the rapid shift to remote and hybrid instruction on their teacher dispositions toward technology integration. The precise purpose of this study was to explore the perceived impact of the rapid shift to remote and hybrid instruction on the teacher dispositions and technology integration of primary public schools providing remote and/or in-person instruction toward technology integration during the ongoing COVID-19 pandemic in Arizona.

This study focused on the following research question:

RQ1. How has the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching?

Before presenting the data collection and analysis procedures, the methodology of this study is discussed.

Methodology

Qualitative studies strive to make inferences through an interpretive lens that provides research on a social concern for an individual or a group. The researcher used inquiry approaches to execute a qualitative investigation, gathered data in the natural surroundings, and interpreted data to acquire themes (Creswell, 2013). This contrasts with the aims of a quantitative study, which aims to collect objective, quantifiable data. Qualitative research examines participant's diverse viewpoints, and implications are considered through the circumstance and context or environment of the participants, through an emergent design where the procedure may be able to

be modified, are reflexive to position themselves regarding the study, and supply a holistic interpretation through numerous viewpoints and determining the different aspects concerned (Creswell and Poth, 2018). Yin (2015) stated there are five features to qualitative research. First, they include the study of actual-world roles to the meaning of people's lives. For example, in this study teachers have lived the experience of teaching remote and/or hybrid during the COVID-19 pandemic. Second, qualitative studies include the representation of the participant's perspectives and views. So, in this study teachers were interviewed to provide their perspective on their lived experiences. Third, qualitative studies account for the contextual conditions of the real world. This study interviewed teachers who have experienced real world emergency remote and/or hybrid teaching with a range of K-6 students. Fourth, qualitative research explains how people think and how they behave socially. Therefore, this study examined the thoughts, perceptions, and self-reported social behaviors of teachers who experienced a worldwide pandemic. Finally, qualitative research uses multiple sources of evidence to recognize potential relevance. In this case, teachers were from three different school sites who experienced remote and/or hybrid teaching. These sources included teacher interviews, teacher artifacts, and publicly posted artifacts. Therefore, this study is a qualitative case study.

Further, Stake (1995) indicated a qualitative case study is a remarkably complex single study for a critical understanding of circumstances within an activity. Merriam (1998) defined a qualitative case study as the analysis and description of a bounded case that can include a social unit, process, person, program, or institution. Therefore, this study investigated the experiences of educators who are part of an educational institution regarding their experiences and self-reported dispositions on transitioning from in-person to remote and hybrid learning during the COVID-19 pandemic.

Creswell and Poth (2018) explained the numerous types of qualitative studies. Phenomenology illustrates the universal core of a unique occasion of a phenomenon. Ethnography is a qualitative composition in which the investigator defines and analyzes shared patterns of beliefs, behaviors, values, and speech of a culture retained via a shared group (Harris, 1968, as cited in Creswell and Poth, 2018). Finally, narrative studies start with lived and told accounts of people's communicated understandings (Creswell and Poth, 2018). However, a case study looks to “develop an in-depth description and analysis of a case or multiple cases” (Creswell and Poth, 2018, p. 110). The unit of analysis of a case study might include a multisite study that has multiple cases or a within-site study, which would be a single case (Creswell & Poth, 2018). Yin (2018) described a case study as an in-depth investigation of a phenomenon in a real-world context, in which it may not be apparent the boundaries between the context and phenomenon. According to Yin (2018), separate from his five features of qualitative research, a case study has five components of a research design: They include the (a) questions of the study, (b) the case(s), (c) any existing propositions, (d) data with linking logic to the proposition, and (e) criteria for the interpretation of the findings. While case study research has similarities to other forms of research that collect data on a subject or subjects, case studies usually focus on qualitative data using methods such as interviews, analysis of sources, as well as observations. Case study research is unique in that it contains procedures that are critical to all modes of social science research. How and why questions are used for explaining and are likely to be used in case study. It is a different form of case study for teaching and practice. Formal case studies need to follow procedures while linking findings to evidence, along with offering findings and conclusions (Yin, 2018).

The following presents the participants, recruitment, data collection, and data analysis methods.

Participants

The participants of this study were kindergarten through sixth-grade teachers who had been teaching during the ongoing COVID-19 pandemic, specifically those that met the following inclusion criteria:

- A. They have been a part-time or full-time employee certified to teach in any grade kindergarten through sixth-grade;
- B. They taught at least one semester before March of 2020;
- C. They taught any time between March 9th, 2020, and December 18, 2020;
- D. They taught in modalities that include remote or hybrid instruction; and
- E. They have remained in the same school district which is the case.

The district website provides information on the teacher population in this region for the 2019-2020 school year. The teacher demographic information indicated eight hundred and sixty-four certified staff. Of the certified staff, four hundred eight are Hispanic/Latino. Other demographic groups represented by certified staff are as follows: three hundred sixty-one are White, twenty-six are Black or African American, thirty-seven are Asian, nine are Native American, or Alaska Native, and one is Native American or other pacific Islander.

Recruitment

The researcher completed and submitted a form of interest to conduct research to the district Student Services Department. The researcher awaited a formal written approval letter to begin the study. Upon approval, recruitment began with the researcher contacting the school site principal and leadership team members in one city school district in the American southwest.

This introductory email included information about the study, including informed consent and confidentiality documentation and a request for an introductory meeting (see Appendix A). Next, the researcher met with the principal or an appointed leadership team member to answer any questions about the study. Third, a member of the leadership team emailed the school staff an invitation to participate in the study (see Appendix B). This invitation included a link to an online interest form that included informed consent (see Appendix C) and confidentiality documents, ensuring potential participants met the inclusion criteria and allowed them to indicate a convenient date and time for an interview.

Pilot Test

Prior to the participant interviews, in order to ensure the interview questions were ready to use for the study, the interview protocol was reviewed by the committee members. Adjustments were made to the protocol based on feedback. A co-chair member further reviewed it. Additionally, the researcher piloted the test questions on a teacher who met the criteria of the research participants. The feedback was used to further modify the interview protocol.

Data Collection

Interviews were conducted via video conference. The participants used an online appointment scheduler to reserve an available time slot. With the interview being conducted via video conference call, the participant received a calendar invitation and a video conference meeting link in preparation for the interview. The interview was recorded via the video conference recording features. The interview was conducted as described in the interview protocol (see Appendix D). The researcher requested artifacts from the participant to be included in the data analysis. During the interviews, participants referenced artifacts that did not include student identifiable information such as lesson plans, training/reference materials, information

posted to Google Classroom, and other instructional artifacts. During the interview the researcher requested the artifacts mentioned be shared via Google Drive. Additionally, the researcher accessed public artifacts from the district website that were posted during remote/hybrid learning, such as instructional resources for parents, guidance on supporting student learning, and feedback surveys geared toward collection of parent/guardian feedback.

Data Coding and Analysis

For data analysis, the researcher followed the steps of applied thematic analysis (Guest et al., 2011). The transcripts were professionally transcribed after securing a nondisclosure agreement. Transcripts were compared to the original recording by the researcher for accuracy. The text of the transcripts were segmented by inserting page breaks at the start of each question, bolding speaker names, and underlining questions. The researcher engaged in structural coding, where questions were labeled to identify the general topic of the question. The researcher adjusted some of the quotes to remove sounds and speech patterns that do not add to the content such as “um's and ah's” and other extraneous content from the interviews. The researcher standardized the appearance of speaker names by removing the interviewee's identifiers and replacing them with an pseudonym. The researcher imported the transcript into the coding software. Further, the researcher imported selected artifacts requested from the participants at the conclusion of the interview process, into the coding software (ATLAS.ti). The researcher conducted various rounds of reading through the data and coded for content by noting essential words or phrases to understand the answers to the study's research question. Through various rounds of coding, the researcher added words or phrases as codes relating to each piece of coded content. The initial coding resulted in 135 codes. Once all transcripts, participant artifacts, and public artifacts were coded, the researcher created a list of four initial themes. The researcher

engaged in additional rounds of coding, examining what codes may have been missed during the initial rounds of coding. During this process twenty-eight codes were merged with one another, and four new codes were identified. The researcher produced a final list of five themes and one hundred eleven codes. In the end, the researcher created a final codebook that lists the themes present in the transcripts and artifacts, the basic definition of that theme, and the codes that contributed to the theme (Guest et al., 2011). Member checking was conducted. The researcher sent the participants the final collective themes to each participant and allowed them to make any comments if they chose.

Ethics

Informed Consent

The researcher received informed consent from the participating teachers and began to conduct the research study. All informed consent documents were electronically shared via a survey maker, and a digital signature indicated consent to participate in the study.

Confidentiality

Participants' responses to the electronic forms and interviews were kept confidential within password-protected files by the researcher. The results of this study may be used in reports, presentations, or publications, but participant names will not be used.

Data Security

Data and recordings were kept private through password protection. The researcher's password was not shared with anyone. No one beyond the researcher had access to data or the recordings except for a transcription service. The transcription provider signed a nondisclosure agreement.

Trustworthiness

Lincoln and Guba (1985) explained quality criteria applicable to all qualitative designs. They include credibility, transferability, dependability, confirmability, and reflexivity.

Credibility

Lincoln and Guba (1985) indicated that one of the significant criteria for trustworthiness is credibility. It is vital to get information from the direct data source to establish credibility, and this would be similar to internal validity. Lincoln and Guba (1985) indicated techniques that would make it likely that the findings and interpretations from the study would be credible. These techniques included prolonged engagement, persistent observation, triangulation, and member check. Prolonged engagement consists of a lasting presence to invest enough time to become familiar with the setting and context, build trust, and get rich data. Therefore, the researcher had prolonged engagement in two ways. The researcher analyzed the data through an iterative process of reading and rereading the transcripts, teacher artifacts, and public artifacts over five weeks on a daily basis. The researchers conducted numerous rounds of coding for prolonged engagement with the data. Additionally, the researcher has had prolonged engagement within the school district of this study. Although the researcher did not have prolonged engagement at the school sites with the teachers in the study. The researcher is an employee of the school district and has prolonged engagement with the community and learning culture.

Triangulation refers to either data triangulation, investigator triangulation, or method triangulation. Method triangulation consists of using multiple methods of data collection. The researcher employed multiple methods of data collection consisting of participant interviews, teacher provided artifacts, and publicly posted artifacts. The fourth technique is member check. This consists of providing data, analytical categories, interpretations, and conclusions to the

members from which the data was collected for the researcher and participant to view the data. Member check was utilized as participants were sent the themes to review and provide feedback if participants chose to do so.

Transferability

Transferability is how qualitative research results can be transferred to other contexts or settings with other respondents. A strategy to ensure transferability is called thick description, and thick description is beyond describing the behavior or experiences and provides information on the context, so the meaning is provided to outsiders (Lincoln and Guba, 1985). The researcher employed context to the teacher information from the quotes provided so the reader would understand the context in which the interviewer was providing information. (Example: The teacher indicated she would enter a room. The researcher prefaced the introduction to the data explaining that breakout rooms were used in a remote environment.)

Dependability and Confirmability

Dependability consists of the participant's evaluation of the findings, interpretation, and study recommendations. This provides stability to the findings over time and views the supported data received from the study participants. Confirmability consists of establishing the data and interpretations derived from the data and not from the researcher's imagination. In this research, the researcher shared the final themes found through the analysis with the participants, inviting their feedback. Further, the researcher worked with her dissertation co-chairs to confirm the relationship between the codes and final themes. Additionally, the researcher kept an audit trail that described the research steps from the start of the research project that extended to the development and reporting of the research findings. These records were kept throughout the study (Lincoln and Guba, 1985).

Reflexivity

Reflexivity consists of the process for the researcher to take part in a critical self-reflection and reflection on the relationship with the participants. A strategy to address reflexivity is the use of a diary. This provides a log to examine the researcher's conceptual lens, explicit and implicit assumptions, values, and preconceptions, and how these components affect the research design during all phases of the qualitative research study (Lincoln and Guba, 1985). The researcher kept a diary to record assumptions, and ideas formed throughout the research process. The diary was used to assist in determining research decisions throughout the phases of the study.

Summary

This chapter provided an overview of the research design consisting of a methodology. It also provided a description of the research participants, recruitment, data collection, data analysis, ethics, and trustworthiness. Chapter four presents the research results.

Chapter 4: Data Analysis and Results

Introduction

The following chapter details the research design of this study. In this case study, the researcher interviewed fifteen participants (until saturation was reached) from three public primary schools from a single school district that taught through emergency remote teaching during the initial onset of the COVID-19 pandemic. The researcher interviewed these teachers regarding the impact of the rapid shift to remote and hybrid instruction on their teacher dispositions toward technology integration. The precise purpose of this study was to explore the perceived impact of the rapid shift to remote and hybrid instruction on the teacher dispositions and technology integration of primary public schools providing remote and/or hybrid instruction toward technology integration during the ongoing COVID-19 pandemic in Arizona.

Research Question

This study addresses the following research question:

RQ1. How has the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching?

Research Approach

Interviews with fifteen teachers were conducted via video conference in December of 2022. The interview transcripts were professionally transcribed. Transcripts were compared to the original recording by the researcher for accuracy. As part of the data analysis the researcher obtained teaching and informational artifacts from the participants that were shared with students/parents during remote/hybrid learning. Additionally, the researcher obtained publicly posted resources from the district website to include in the data analysis. The researcher imported the transcripts, selected artifacts, and publicly posted artifacts into ATLAS.ti, a web based qualitative data

analysis software. The researcher coded for content. The researcher produced a final list of five themes and one hundred eleven codes. Member checking was conducted. The researcher sent the participants the final collective themes to each participant and allowed them to make any comments if they chose. Finally, in the end, the researcher created a codebook as represented in table 1 below.

Table 1

Code Book

RQ1. How has the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching?

Important Codes (of many)	Categories	Themes
M-Student Capability, TK-Hardware, TK-Apps M-Student Capability, A- Initiative, A-Social Responsibility M-Student Capability, A-Self Directed Learning, A-Initiative, A-Empowerment	Students capable in technology use Students capable partners with peers in their learning Students capable as independent learners	Teachers came to view students as capable
M-Importance of Technology, A-Social Responsibility, TK-Apps, A-Adaptability TK-Apps, TK-Learning Platform TK-Hardware TK-Apps CK-Instructional Concepts CK-Curriculum CK-Student Standards CK-Subject Matter P-How Students Learn, PK-Instructional Strategies, PK-Breakout Rooms PK-Evidence of student learning	Teachers came to see technology as a skill that would be used throughout a student's life. Teachers became mindful of the reasons to integrate technology. Teachers were mindful of using technology aligned to content. Teachers were mindful of utilizing instructional strategies appropriate for student learning.	Teachers came to see the importance of balanced technology integration
TK-Parents/Guardians, TK-Learning Platform TK-Informational Resource A-Fostering Partnership, PK- Educational Resource, PK-How Students Learn	Teachers came to see the importance of providing readily available resources for parents. Teachers saw the importance of keeping in communication with parents.	Teachers saw value in parent/teacher partnership
TK- Apps PK-How Students Learn, CK-Curriculum PK-Instructional Strategies, PK-Learning Styles	Teachers had to think about how they would transfer in person instructional strategies using digital tools.	Teachers came to see how technology could supplement in person instructional strategies
TK-Apps PK-Educational Resources TK-Gained Knowledge CK-Peer Support PK-How Students Learn PK-Instructional Strategies PK-Breakout Rooms PK-Student Participation TK-Gained Knowledge	Teachers made and shared resources with their peers Teachers shared their educator knowledge with their peers.	Teachers saw value in working collaboratively with their peers

Note. This table demonstrates the elements of the codebook used for the research study.

Findings

After analyzing the data of all the participants, five themes were most pronounced. (1) Teachers came to view students as capable. (2) Teachers came to see the importance of balanced technology integration. (3) Teachers saw value in parent/teacher partnership. (4) Teachers came to see how technology could supplement in person instructional strategies. (5) Teachers saw value in working collaboratively with their peers. The following presents the themes along with the accompanying categories and participant quotes. Each theme summary reviews the findings of this research study as well as how these findings relate to previous research.

Theme 1. Teachers Came to View Students as Capable

Teachers expressed viewing students as capable. Students were able to successfully use technology tools, collaborate with their peers, and be independent learners. Teachers viewed students' ability to navigate technology tools for instruction, share their learning during collaboration with peers, as well as be able to learn on their own. Teachers indicated a shift in attitude of student capability. Additionally, they acknowledged a realization of seeing the students as capable. One of the teachers had expressed a belief about students that existed prior to the pandemic, indicating a belief that everyone is capable of learning, and it is up to the person to decide to take part in the learning. An analysis of the data presented three primary categories related to student capability: (1) Students capable in technology use, (2) Students capable partners with peers in their learning, and (3) Students capable as independent learners.

Students Capable in Technology Use. Several of the technologies used during the onset of the pandemic had not yet been used by students in a remote/hybrid setting. Students demonstrated the use of technology through support from their teachers. The teachers also came to the realization that students already have existing knowledge and are capable students. For

example, one teacher indicated that students are capable of using technology, even at a young age. Morgan indicated:

...I never really used Google Classroom with my kids and now I do. Um...having them understand how to use their iPads in more than, you know, one way than just using it for Lexia. But, um, their ability to use it is, you know, the knowledge that they have I didn't really realize until we were in the pandemic, how tech savvy they can be at five years old, you know?

The teacher expressed student capability in using iPads for multiple purposes. Similarly, another teacher expressed her belief that students are capable in technology use. Faith said:

I think all kids can learn. I think the fact that some parents were very turned off to technology and they were, "No, my kid can't do it," um, and I... Yeah, I mean, we taught parents just as well as we taught kids how to get their kid on, how to work, um, when to come on, when to get in your Google Meet. So we had to do all that stuff. So my belief is that anybody can do it. Whether they want to do it or not is a different story, but anybody can do it.

That is, Faith expressed that all people are capable of using technology, but self-belief can sometimes get in the way. Another teacher also pointed out that students are capable in technology use while discussing students' ability to adjust and adapt to changes. Ana indicated:

...our world is evolving. Everything is a computer. Our phone is a computer. And, um, when the pandemic hit, you know, a lot of the students were able to it seem like, adjust relatively to, uh, working on the computer. Um, they didn't really have the, um, the discipline to stay on task... I see it as a tool. They see it as a toy. And so that's my job is to try and teach them, "Okay, this is, this is our tool. This, this is how we're gonna use it.

We're gonna use it for research, we're gonna use it to learn, we're gonna use it for our math." And I mean, that continues even today. But my, my belief for technology is, is pretty high because I feel that it's very important and we need to know how it works, and we need to know how to be responsible with our technology.

For Ana, an important belief for her was that technology is a tool for learning and her role is to help students understand its use. Collectively these teachers reflected on students being able to use technology and how technology is used for the purpose of learning.

Students capable partners with peers in their learning. Students were able to learn from one another and take on a social responsibility for peer learning. Students exhibited behavior of working collaboratively with peers to learn, sharing their knowledge, and were seen as a learning resource for their peers. One teacher described her experience with watching her students working with peers during video conference breakout rooms. She expressed that students were able to be in charge of their learning while working with peers during reading.

Trinity said:

But even if I bounced to another working room to see it, 'cause all the kids were in different rooms... if I came into a room, I would hear them reading together. I would see that they would be reminding each other what they're supposed to be doing. Like, it was just like... walking into a community that was already self-sufficient... I would [say], "Okay, what are we doing now? What are you guys working on?" And then, we would go from there. So, it was kind of exciting for the breakout rooms, because all the kids kind of had their own kids that they were working with, and they were all put into the kids that were reading the same stuff and on the same levels. So, they knew what to do 'cause we'd

done it whole group enough, and they just kind of took charge of it on themselves and did that when they were in their little small groups too. So, that was really cool to see too.

Beyond students being capable of doing learning tasks, Trinity described the students as “community” members that help one another learn. Similar to Trinity’s statement, Faith described a student who took charge of her own learning and shared her knowledge with her teacher and peers. Faith indicated:

I had one little girl in the afternoon, I had art, and she, um, she taught me stuff. She would say, "[Teacher], look what I learned today," um, and I would say, "How did you learn that?" "I was just looking it up." So she would teach. We had, uh, five kids in our, our class, and she would share her screen and teach, and teach me stuff. So it was a lot of fun.

This student demonstrated a desire to learn and share her knowledge with both the teacher and class using the technology tools available. In this spirit of using technology for learning, Sofia said, “So, the pandemic kind of opened up that whole channel of, of utilizing the technology to, to share your thinking and responses.” Whereas one could focus upon the challenges created by the pandemic, Sofia describes it as opening “[a] whole channel,” a path to sharing knowledge through technology. Accordingly, research participants expressed the use of peers sharing their learning with peers in a remote/hybrid environment.

Students capable as independent learners. Teachers indicated students are capable of learning without being told what to do by the teacher. Teachers expressed the realization that students need to be provided the opportunities to learn independently, actively seek to learn, and students need to realize their potential to be independent learners. Ruby shared how students learned to be more independent in their learning while the teacher was working with other

students. Ruby indicated:

...during the pandemic, I mean my...camera was off 'cause I was in another room and they couldn't just like, "Miss," or raise their hand. Like... I was there because I was recording them and they knew I was recording them. But I'm- I'm with my small group... doing our reading activity for the day. And so, they had to learn to be a little bit more independent. And so, and I found value in that.

Ruby expressed value in students being independent learners. Similarly, another teacher, Avery, described many ways that students could learn on their own using technology. Avery said:

So, the kids are very much able to learn through technology, um, whether it's a person in a video or a voice or whatever, telling them things, reading things to them, or if it's a resource they have to read themselves, look at themselves, manipulate themselves. I- 100%, they can learn through technology, as long as they are actively paying attention to it.

This is to say that when students are actively engaged in focused learning they are able to learn independently. Similarly, Drew talks about students' capability to navigate their learning. Drew expressed:

But with the pandemic, where they had a lot of... assignments and information online, and they were able to maneuver through it, it showed me that I don't really need to hold their hand as much. I just need to be able to get them to realize that they can do it, opposed to me, like always trying to guide them... It just made me realized that or just reiterated to me that they can, they can do it, they just going to be pushed a little bit more, they need to be given a little bit more freedom in their learning.

Drew expressed the importance of students believing they are capable of doing this work independent of the teacher and the pathway to this independence is through providing students more “freedom in their learning”.

Theme Summary. This theme focused solely on teachers' beliefs of student capability. Teachers believe students are capable of technology use, working with peers, and they can also take part in independent learning. Teachers expressed the notion that due to the experiences they had during remote/hybrid learning, they came to see students as being capable in their learning during a time of what was an unexpected modality to educate students. The majority of which may not have expressed the same types of beliefs had they not experienced remote/hybrid teaching.

The literature documents the connection between student capability and teacher mindset. Bergold and Steinmayr (2023) indicated that student performance is impacted by teacher judgment on what the teacher believes a student is able to achieve. Similarly, in this study teachers view students as capable technology users, working with peers, and working independently. Mayo et al., (2009) discussed student engagement, interactivity, and group learning as features of social constructivist learning. Similarly, additional literature documented the impact of peers working together in a social learning environment. Garbe et al., (2020) indicated that learning outcomes are based on student socialization as well as interpersonal relationships and problem-solving. Student learning activities consisting of interaction assist in fostering skill, such as group work, taking turns, and a positive relationship with fellow students. Thus, aligning with creating a “community” and “channel” of learners. The participants in this study emphasized students as a community of learners who are capable of helping one another, as well as providing a channel of support to share knowledge. In contrast to social interactive

learning, but in alignment with student capability, Ghazali (2020) indicated that during the COVID pandemic teachers have less control with students and it is ideal to encourage self-access and learning independently. Additionally, Nkoala & Matsilele (2023) indicated when students have access to resources they can inquire about learning without teacher direction allowing for a student-centered approach to learning which fosters student autonomy. This autonomy aligned with a participant interview indicating the importance of allowing more “freedom” in student learning. These scholars agreed that student capability can be fostered through both social interaction as well as independently. As shown in the accounts of the participants, teachers saw students as capable learners, as well as expressed the belief that students could be allowed freedom in their learning without as much guidance.

Theme 2. Teachers Came to See the Importance of Balanced Technology Integration

Teachers expressed the view of technology needing to be used in a balanced way and when appropriate to student learning. Teachers expressed technology as being part of life skills, the importance of understanding the reasons to integrate technology, and aligning technology integration to instructional content, as well as instructional strategies. An analysis of the transcripts presented four primary categories related to balanced technology integration: (1) Teachers came to see technology as a skill that would be used throughout a student’s life, (2) Teachers became mindful of the reasons to integrate technology, (3) Teachers were mindful of using technology aligned to content, and (4) Teachers were mindful of utilizing instructional strategies appropriate for student learning.

Teachers came to see technology as a skill that would be used throughout a student's life. Teachers indicated that using technology is a tool which is useful and that will be used in the future for students. It is considered a necessity and a part of the way of life. Nina stated:

Um, so I feel like they became a lot more dependent and wanting the technology more.

Um, which I was a little bit surprised at 'cause I thought they wanted to come in and have fun and just play. Which they did. But they gravitated toward the technology. Um, and before the pandemic, it was not like that. It was, it was a choice and some of them picked it up and some of them didn't. But I feel like most of the kids gravitate towards and almost feel like it's a necessity to do every day, um, than before.

The teacher expressed noticing the normalcy of technology use from a student view.

Similarly, another teacher expressed her beliefs of utilizing technology as an essential tool in life.

Ruby indicated:

Well I just feel like, um, like the- the technology part to it like really changed. 'Cause I- I don't know beforehand if I really felt like technology was a necessity to their learning. Um, now I see like- like it's something- like and- and now, I mean maybe not when I was growing up, but now the kids need technology. Like it's- it's essential for them. Um, it- they're gonna be using it for the rest of their lives. And so, I really feel like that- that piece of that pie really made itself apparent during the pandemic to me. I mean before it was just like the content and the students learning, okay that makes sense. But now like there is that technology piece that needs to be there.

Ruby pointed out the use of technology is “essential” to student learning due to the integration of technology tools in people’s everyday lives. Alternatively, another teacher pointed out the existing usefulness of using technology when appropriate. Bianca explained:

And the pandemic didn't change the fact that technology is still a useful tool. Um, it's a great tool to have in your toolbox as a teacher, as a student. Didn't change that part, and I guess what happened was that we used something that should be kind of a... I guess it's

like using like a power screwdriver. So, sometimes all you need is a, just a regular screw driver, you know? Like with the technology part, it's awesome, yeah, we have this really cool thing that can help us with that, but do we need to use it all the time? No, and I think the kids are starting to realize that sometimes your computer is handy. Sometimes, it's not, and sometimes, you can be okay just reading an old-fashioned book, and you'll be fine.

For these teachers, they saw value in using technology due to the skills that need to be obtained based on the amount of technology used in everyday life situations.

Teachers became mindful of the reasons to integrate technology. Teachers indicated that technology has value as a learning tool. It can be used to assist in moving the learning forward for students. One teacher explained the purpose of technology use and the reasons for using this tool. Ana stated:

And so that's my job is to try and teach them, "Okay, this is, this is our tool. This, this is how we're gonna use it. We're gonna use it for research, we're gonna use it to learn, we're gonna use it for our math." And I mean, that continues even today.

This teacher expressed her view of it being part of her job to educate students about technology use for learning. Similarly, another teacher valued technology use. Nina said:

I mean I've gained an appreciation. I do see that technology, I do value it. I, I do see there is a p- a point to it and because of where the kids are going, they need the technology. So it's just kinda streamlining it of how I can use it for good (laughs) rather than evil kind of a thing. How can I put it, to have it on my side? And yes, since they like it sometimes and they wanna play the games, how can I use that as, um, as a tool in my tool belt, um, just to further their learning.

Nina expressed the importance of knowing technology is a tool for students and thought of ways in which it can be used to “further their learning.” Similarly, another teacher saw technology as a tool to gather evidence of student learning. Daniella explained:

I mean, I, I value it a lot more now, I think, 'cause I, I'm able to see how when you're in a bind, how you can really connect with someone else or, you know, through, through this technology and especially because of, of, you know, being able to connect with your students and see their work like through Pear Deck th- was like really mind blowing for me.

Daniela explained how she came to see the beneficial reasons of technology integration and how it related to connecting teachers with student work. Combined these teachers related to being mindful of the reasons for technology integration through their experiences with remote/hybrid learning.

Teachers were mindful of using technology aligned to content. Teachers considered the content that needed to be taught to make instructional planning decisions. This was used as a determining factor taken into consideration during remote/hybrid instruction. Hope indicated:

And so, I feel like during the pandemic, I had dived a lot deeper into our content, and would spend hours reading every single part of every lesson, trying to figure out how to incorporate everything, but in a way that my kids could access it remotely.

Hope spent time focusing on the content while still thinking about how to make this content accessible in a remote environment. The following teacher artifact below exhibits how a teacher displayed information in a Google Classroom related to resources used for a specific content area. Teacher Artifact 1C:

Anchor Charts

Close Reader Anchor Chart	Posted Sep 14, 2020
Six Syllable Types Anchor Types	Posted Sep 13, 2020
Discussion Norms Anchor Chart	Edited Aug 27, 2020
Writing Short Constructed Responses	Posted Aug 25, 2020

This teacher artifact was used as a resource to students/parents to access anchor charts for learning. Another teacher shared how technology was used for student reading. Daniella stated:

Being able to do those things, um, s-... I, I value technology and I think it's a good thing, um, but like I said, as far as w- how it helps students learn, it does. I mean, my students are getting a lot better in their reading skills because of Lexia and that's a, that's a computerized, um, program to close reading gaps. So it can help a whole lot but it can't be the only thing.

Daniella iterated the value of technology as students have used it to assist with their reading skills, but also indicated technology use is not the only thing that helps students in the content area of reading.

Teachers were mindful of utilizing instructional strategies appropriate for student learning. Teachers realized that students learn in different ways. They took this into consideration when planning instructional strategies during remote/hybrid instruction. The following teacher indicated the utilization of mixing students into different groups for learning. Drew indicated:

The kids were able to guide each other. They were able to present each other's screen, explain each, ex- explain their own work. They're able to maneuver through the different Google tools. So, I think just pushing them through those groups and switching the

groups up every now and then, showing me that or help me realize that they're capable.

And that's how I was trying to facilitate all that.

Drew indicated a strategy used to assist students in their learning was to have students guiding each other in their learning through using technology tools to share their work and utilizing a variety of different student groups. The following Teacher Artifact 1A displayed how student Breakout groups (displayed in Google Classroom) were organized in order to implement small group instruction or collaborative learning groups.

ClassRoom and Breakout Session Links

ClassRoom Link	Edited Aug 31, 2020
Work Room 1	Edited Mar 15, 2021
Work Room 2	Edited Sep 10, 2020
Work Room 3	Posted Sep 3, 2020
Work Room 4	Posted Oct 23, 2020

Another teacher talked about considering how students learn. Faith indicated:

Um, like I said before, they can learn anything. It's just the way you go about doing it.

Like before I said, there was kinesthetic learners, and visual, and audio. Well, now there's computer (laughs), computer learning, uh, um, tech- technology. Kids learn through technology, and some kids, that's where they thrive. So I have to make sure that I add that into what I'm working on.

Considering the different types of ways students learn, Faith indicated that a mode of student learning can also be through using a computer. For Faith, the utilization of technology was an instructional strategy that she ensured to implement for her students.

Theme Summary. This theme focuses on the importance of balanced technology integration for student learning. These teachers talked about how technology served a purpose in teaching and learning. These purposes included the use of technology skills throughout a student's life, being mindful of reasons to integrate technology, as well as aligning the technology to content and the utilization of instructional strategies for student learning.

The literature documented the importance of obtaining technology skills to assist students with relevant “essential” life skills. Spiteri and Chang Rundgren (2020) indicated the importance of teachers' realization of the potential of technology in daily practices and the need to develop expertise for teaching and learning. Failure to do this could impact students' futures in the information technology age. Similarly, pointing out reasons to use technology, Serap Kurbanoglu et al. (2006) indicated the need for independent and lifelong learning skills in students. While essential skills in this information age consists in the ability to self-regulate learning as well as understanding the importance of information literacy in a society that is highly information based. There is a need to know how to continue to learn. Thus, supporting how technology can be used as a tool to “further their [student] learning”. The findings of this study agree with the authors of Mishra and Koehler (2006) as mentioned in chapter 2, aligning with two sub-themes. For example, one subtheme of this study was being mindful of technology aligned to content. Participants thought about how they would instruct students on content, thus taking time to learn more about content knowledge or apply their content knowledge to instruction. Further, another sub-theme presented being mindful of using instructional strategies appropriate for student learning. For example, teachers thought of ways to differentiate instruction, and provide small group learning. Components of Mishra and Koehler's TPACK framework align with this theme. They include technological knowledge (TK) relating to knowledge of everyday technologies,

content knowledge (CK) relating to a subject matter that is instructed upon or that will be retained, as well as pedagogical knowledge (PK) which consists of in-depth knowledge of practices, instruction, and learning methods.

Theme 3. Teachers saw value in parent/teacher partnership

Teachers indicated the importance of communicating with parents during remote/hybrid instruction. An analysis of the transcripts and artifacts presented two primary categories related to parent/teacher partnership: (1) Teachers came to see the importance of providing readily available resources for parents and (2) Teachers saw the importance of keeping in communication with parents.

Teachers came to see the importance of providing readily available resources for parents. Resources were considered important to facilitate the accessibility to learning. These resources assisted in the facilitation of student learning in partnership with parents during remote/hybrid learning. Teacher Artifact 2 provided an excerpt of the resources made available for parents. “Dear parents/guardians, This school year your child will be using Google Classroom to access their lessons. Below are the steps to help your child log on to Google Classroom.” Alternatively, another teacher indicated sharing resources on their Google Classroom for parents to access and share with their children. Morgan indicated:

... so in reading,...when we do letter names and sounds, we do a lot of dancing. And, and we do a lot of hand motions and singing and so we would try to do it with the kids, but it was hard for them to sometimes follow us. So we recorded ourselves doing it and we would send it to them a- and ask the parents, you know, to have them watch it. And we've had them watch it with us, um, and do it at home. But it, it was consistent. It was in their Google Classroom. Um, we could see that they were learning the, you know, the motions

and the song. Um, so, uh, we kind of, we did a lot of recording of what we would have normally done in the classroom. We recorded ourselves a lot to show, you know, so they had something to watch.

This teacher saw a partnership with parents to assist in ensuring students had access to the learning resources and encouraged the viewing of these types of visual/audio resources. Another teacher indicated creating resources that taught both students and parents how to access information. Bianca stated:

I was always technology heavy before. Um, really, the new aspect of it was the online aspect. So, if anything, it showed me how to make, kind of how to address and adapt to make tutorials to share with kids and families on how to access things. So, my skills with that improved.

All of these teachers saw a value in providing resources to parents to help foster a partnership with parents to support learning during remote/hybrid learning.

Teachers saw the importance of keeping in communication with parents. Teachers indicated the importance of communicating information to parents during remote/hybrid learning. Charity indicated:

Uh, I think one of the biggest habits and beliefs was, um, surrounding, uh, parent communication. You know, up until that point we had, you know, apps and things that we had parents connect to, but we would have maybe 40% of the class on there or, or 50% of the class. But it just was so imperative that every single parent was connected during the pandemic or that we had some kind of contact, even if I was texting them with like my personal number or I made a Google phone number to, to contact them with if I

didn't wanna give out my personal information, I had contact with every single parent.

And that has been the norm since then.

This teacher talked about the importance of having communication with all parents.

While the public posting below on the district website supported parent/teacher communication.

This Public Posting: Remote Blended Learning indicated:

Parents and caregivers are not expected to take the place of their students' school teachers. Instead, they should play a support role by keeping children engaged and thinking critically. Click below for a list of helpful tips.

These types of district public postings assisted teachers with communicating helpful tips to parents to support learning. During this challenging time Sara shared her experience with the student's day time guardian:

Um, well, a lot of parents are at work, so a m- majority of the students were either Nana or Tata, and, um, I had an experience where one Nana was crying, and I felt horrible 'cause Nana really wanted to get her granddaughter onto our video call, and she couldn't get, she couldn't figure it out. And so, it was also brand new for her, and brand new for me to explain it, in Spanish (laughs). Um, so, yeah, it was, it was not only hard for me, it was hard for my student, and difficult for the adults that were supporting them at home.

Thus, this teacher shared the importance of communicating with parents/guardians in support of student learning, regardless of the challenges that were being faced for students, or parents/guardians, additionally as well as the challenges faced by the teacher herself. The above information provides examples of how communication with parents/guardians was important to teachers during remote/hybrid learning.

Theme Summary. This theme focused on the teacher's value of parent/teacher partnership. These teachers believed it was important to provide resources to parents so it would impact student learning during remote/hybrid instruction as well as being able to connect with parents to communicate about their students. The literature documents the importance of parent communication and aligns with this study. Chen and Rivera-Vernazza (2022) indicated that at the center of a durable teacher-parent partnership is effective communication. In this study, teachers supported strong communication by providing parents with resources as well as a channel of communication to support student learning. Bai and Gu (2022) indicated that during the epidemic teachers provided reminders to students as well as learning tasks, while also providing guidance to their learners by sending digital mobile phone messages to parents. The research aligns with the action of the participants in that they provided resources on student learning as well as use of digital communication. Additionally, Hu et al. (2021) indicated the importance of parent/teacher communication to create a support system that would support younger students who need assistance in accessing informational resources and providing feedback. All of which align with this study's findings on sharing resources and fostering communication.

Theme 4. Teachers came to see how technology could supplement in person instructional strategies.

Teachers indicated thinking about how they would transfer in person instructional strategies using digital tools. Teachers indicated the effort put into providing a modification of in person strategies to use in a remote/hybrid environment. One teacher contemplated how instructional strategies could be implemented on a laptop device for student learning. Trinity indicated:

So basically, I had to figure out and learn on the computer how to create those activities on a laptop, whether it was a PowerPoint slide, or whether it was a Word slide. However I did it, I had to somehow, I guess, change it into, transfer it over to where it would work on a computer. So, that's what it made super different, is just, that was a lot of work. Like, just trying to change everything over to where, I had to put a lot of thought into, "Okay, this is what kids need to learn. This is what they need to do. How am I gonna make that look on a laptop? Like, how would that work with kids working together? Would they be able..." Maybe it was moving something. I was like, "Okay."

This teacher indicated a need to determine how students would work together or manipulate technology to demonstrate student learning. The following teacher talked about using technology tools for students to demonstrate their learning as well as her indicating the importance of providing the structure of a regular school day to keep consistent with an in-person instructional day. Ana said:

But I mean, we, we made it, we made things happen. Um, you know, the, we, we made, um, like, um, schoolwork, we put text boxes in there so the kids could type into it. Uh, we had brain breaks that, you know, I would project and it's like, "Okay, everyone get up. We're gonna, we're gonna move and do a brain break." Uh, we had bathroom breaks where I'd put a sign up on my, my Google Classroom. "Okay, everyone take 15 minutes, go to the bathroom, get a drink." And, and I mean, it was, it was honestly conducted as close as we could to just being in class. Um, it wasn't as long, you know, we did, um, have lunch and then the, the end of the day. And then, um, my teammates and I, we would, um, get together on a Google Meet and then just kind of figure out what we were gonna do the next day.

Ana indicated the importance of supplementing in person instructional strategies in a remote environment. The following teacher indicated the need to manipulate learning materials in a digital environment. Nina said, “I learned how to translate a lot of stuff that we do, like, at school onto, into a technology, into something that they can manipulate on the screen.”

Theme Summary. These teacher examples provided information on how they attempted to align aspects of in-person experiences to a remote environment. Whalen (2021) indicated that during remote learning teachers did increase their use of technology tools and applications to replicate traditional in person classroom practices to deliver content, share information, present in real time and for grading purposes. Similarly, Shamir-Inbal & Blau (2021) indicated the immediate pedagogical challenges from transitioning to distance learning that included teachers needing to adapt their teaching methods from in person instruction to a new medium of technology and to the student learning level. In this study participants indicated an increase in technology use and knowledge as well as purposefully attempting to adapt their current understanding of in person instruction to that of instruction for a remote environment, while also indicating the continued utilization of some skills and practices gained during the pandemic when returning to face to face instruction.

In contrast to ERT, technology integration typically utilizes a technology integration theoretical framework. Some of the most predominant were discussed in depth in chapter two which consisted of: Substitution, Augmentation, Modification, Redefinition Model Framework (SAMR); the Technology Integration Matrix (TIM); Extend, Enhance, Engage (Triple E) Framework; Passive, Interactive, Creative, Replaces, Amplifies, Transforms (PICRAT) Matrix; and Technological Pedagogical Content Knowledge (TPACK) framework. Although ERT was utilized during the pandemic, it does not automatically eliminate the utilization of some of the

components throughout these frameworks. For example, teachers indicated they were substituting technology tools for simple tasks that could be applied in person such as the use of breakout rooms to simulate small group instruction, additionally, as indicated earlier portions of the TPACK framework were utilized.

Theme 5. Teachers saw value in working collaboratively with their peers

Teachers shared experiences collaborating with their peers for the purpose of sharing resources, as well as to share knowledge. Two primary categories related to collaborating with peers emerged: (1) Teachers made and shared resources with their peers and (2) Teachers shared their educator knowledge with peers.

Teachers made and shared resources with their peers. Teachers indicated taking time to ensure they collaborated or shared instructional resources with peers. The following teacher shared experiences from collaborating and sharing resources among teachers. Sofia indicated:

Um... and my co-workers and I, I had two other co-workers, and we would team through Google Classroom or Google Meet, uh... probably like three hours a day, we would try and figure out what we were gonna do and how we were gonna get started up. And it- it took a... I think it was one week of just planning and then we went live, so to say, the following week. Um... and we put together a Google document with like a- a lesson for the kids that they would follow and... we met with the kids like an hour, I think it was just an hour in the morning and gave them their lesson and then checked back in. If they wanted to come in we had like meeting times arranged. Um, and that was for the spring quarter from- from March till May.

Another teacher explained collaborating with peers and essentially following along with the resources peer teachers were preparing. Ana said:

So we told the kids, you know, you guys are gonna go and, um, take your stuff home. In hindsight, I wish we could have said, take some books, take uh, your markers, take some paper. But, you know, we, we didn't even think that we would be, um, not back until the end, you know, till, even after school was over. Um, that week, um, my teammates and I, we, uh, went on Google Meets, uh, learned how to, uh... I mean, I, I, you know, I was... that was my fourth year teaching, and so the other tea- two teachers had a lot more experience as far as, you know, slides, putting things together, just, you know, in the curriculum. So I was just kind of following what they were doing. That was my first year at [School District].

Ana explained she was new to the district and followed the lead of her peer teammates in creating resources such as presentation slides or putting additional resources together for remote/hybrid instruction. While another teacher indicated using resources she found or were shared by her teammates for student work. Bianca said, "I'm not sure this is necessarily a new content knowledge, ...or just using more of the resources that I eventually found, uh, either myself or through my team of finding ways to find online manipulatives for students to work with." All of these teachers found value in working collaboratively with their peers for resources during remote/hybrid instruction.

Teachers shared their educator knowledge with peers. Teachers indicated that collaboration with their peers to share their knowledge as educators during remote/hybrid instruction was of importance. Trinity indicated:

So, yeah, for me, I was learning a lot from, we would have meetings online, from, with my other teammates that were on the second grade, and they were in the year before. But just from the curriculum, how they had the extended block, they had it all broken up for

us to where we weren't having to teach everyone, 'cause it was overwhelming, but just what the parts were that were important, and I think that really helped with us planning. It helped with us teaching as well, 'cause then we knew what parts they needed to know in order to, to be able to master the standard that they were working on. Um, that was really helpful, how the district set that up, and it made it a lot easier to plan and to figure out, you know, what they were learning, and what, what, what they really needed to focus on for that part.

This teacher found value in learning from peers in relation to planning instruction and understanding the curriculum to focus on specific standards. While another teacher indicated collaborating with other grade level teachers to discuss supporting ELL students and students with disabilities. Daniella said:

...so I meet with other third grade teachers in the district and we're discussing ways that we can help ELL students as well as, um, students with disabilities and like how do, how are we gonna make an impact in their math, mathematics, um, skills and so we meet twice a, twice a month. Um, and with that group we're like looking at articles, we're, we're planning lessons and then we're..., bringing back the data.

While these teachers established a community of practice among other grade level teachers across the district, another teacher explained how she collaborated with her team to analyze and become more familiar with student standards. Nina said, "So as a team we were able to take deep dives into the standards and actually break them down a little bit more. Um, that was, that did help in that sense." This teacher expressed her experiences with learning more about content knowledge (CK) through interaction and collaboration with peers. This being a component of the TPACK framework.

Theme Summary. This theme focuses on teachers valuing working with their peers to either share resources or share knowledge related to instruction. These findings aligned with literature documenting teacher collaboration of knowledge sharing. Rasmitadila et al. (2020) indicated that teacher collaboration assists in adjusting subject matter as well as a way of sharing knowledge gained through experiences of online learning. Additionally, Bandura (1995) indicated that in people that are collectively oriented, they work together for the benefits they are seeking. Similarly, Mohajan (2017) defined a community of practice (CoP) as people who share an interest in a topic and engage on a regular basis to deepen their understanding and learn to improve. They learned from each other, shared their practices and explored their ideas. Participants in this study shared experiences that align with this research as teachers indicated working with colleagues to support their subject matter understanding as well as learning from their peers to support remote/hybrid instruction.

In contrast Ottenbreit-Leftwich et al. (2010) indicated that teacher values were rarely included in conversations and decisions about technology integration practices that enhance curriculum. This information does not align with the participant interviews of this study. Teacher interviews in this study have indicated being able to take part in conversations and decision making resulting in how they would integrate technology during remote/hybrid learning. Participants in this study did indicate collaboration with their peers as well as teacher peers familiar with their grade level content.

Summary of the Results

The five main themes were shared with all interview participants. One participant responded to the shared themes and indicated agreement with themes 1-4. For theme 5, the

participant indicated this theme was important to the teacher, but the teacher did not experience working collaboratively with peers.

Detailed Analysis

This chapter contains the results of the analysis, connects the analysis back to the research question, as well as with existing research in the field of education. Fifteen participants were interviewed for this qualitative case study. Interview questions were constructed to understand teacher dispositions to integrate technology in a remote and/or hybrid learning environment during the COVID-19 pandemic. All participants were either a part time or full-time employee certified to teach in any grades from kindergarten to sixth grade, taught at least one semester before March of 2020, taught any time between March 9th, 2020, and December 18, 2020 and taught in modalities that include remote and/or hybrid instruction.

Summary

Aligned with thematic coding, 111 codes emerged. ATLAS.ti web-based software was used to discover the five themes that emerged. The five themes resulting from this research study summarize how the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching. These themes include: (1) Teachers came to view students as capable, (2) Teachers came to see the importance of balanced technology integration, (3) Teachers saw value in parent/teacher partnership, (4) Teachers came to see how technology could supplement in person instructional strategies, and (5) Teachers saw value in working collaboratively with peers.

Chapter 5: Conclusion and Recommendations

Introduction

The global pandemic of the coronavirus disease 2019 (COVID-19) had prompted an enormous disruption in day-to-day activities worldwide that initiated swift and unprecedented changes (Rettner, 2020; Van Kessel et al., 2021). The general problem was that most expenditures were directed toward new hardware, software, professional development, and technology access, where teacher dispositions and personal beliefs that often predicted successful technology integration (Vannatta & Fordham, 2004) were not tended to. The specific problem was that the impact of the COVID-19 pandemic upon teacher dispositions toward technology integration had not been established, such that school administrators, policy-makers, and teacher preparedness programs could best support teachers and students. The purpose of this qualitative case study was to explore the perceived impact of the rapid shift to remote and hybrid instruction on the teacher dispositions of K-6 public school teachers providing remote and/or in-person instruction toward technology integration during the ongoing COVID-19 pandemic in Arizona. This study addressed the following research question:

RQ1. How has the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching?

This chapter provides the conclusions and recommendations of this research study. The following information will proceed: (1) Discussion of the Results in Relation to the Literature, (2) Limitations, (3) Implication of the Results for Practice, (4) Recommendations for Further Research, (5) Conclusion, and (6) Personal Growth and Learning.

Discussion of the Results in Relation to the Literature

The five themes resulting from this research study summarized how the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching. These themes included: (1) Teachers came to view students as capable, (2) Teachers came to see the importance of balanced technology integration, (3) Teachers saw value in parent/teacher partnership, (4) Teachers came to see how technology could supplement in person instructional strategies, and (5) Teachers saw value in working collaboratively with peers. Considering these themes, the following information has been deducted to answer the research question.

Collaborations and partnerships

Teachers saw the importance of ensuring there was partnership among their peers to share resources as well as their educator knowledge. This was of great value in order to network with other experts in their field of education that closely aligned with the work they sought to address with their students as it pertains to instruction, planning, and preparation for resources, etc.

Additionally, there was also a partnership with families in order to communicate information and resources available to students to support student learning during remote/hybrid instruction. One of the main goals was to continue to provide educational learning opportunities to students while in quarantine and partnership with parents was seen as a route to support the success of student learning. The literature agrees with this finding as Abuhammad (2020) indicated that a way to support parents with the educational needs of students is to provide parents through the use of internet access to resources and instructional techniques.

Teachers process of learning through the pandemic.

Teachers indicated students were capable of learning within a remote/hybrid environment during the pandemic. Teachers saw students as capable of technology use, working with peers, as well as being able to work independently. Teachers also indicated learning about technology skills, implementing instructional strategies to try to align with in person instructional practices and coming to the conclusion of the importance of balancing technology integration for students.

The literature supported the findings in terms of the perception of how teachers see their students. Brooks & Goldstein (2008) indicated that mindset does not only relate to self-perceptions for teachers, but can also assist in understanding student behavior. Indicating how teachers see and approach their students can foster student behavior outcomes. Additionally, Zhao & Watterston (2021) indicated the teachers' role is not to be the sole person of information, but to organize student learning and learning resources, as well as be a motivator of student learning. This literature emphasized the important role teacher's play in student learning.

Challenges

By the way, these teachers taught during the most recent global pandemic, since the 1918 influenza pandemic that spread worldwide over 100 years ago (Centers for Disease Control and Prevention, 2019). The information from the CDC (2023) provided the severity of impact this pandemic has had on people's lives worldwide. As of March 14, 2023, there has been a reported 103,672,529 total cases of COVID-19 infections and 1,119,762 deaths due to the pandemic. The pandemic was an unforeseen world emergency. In an effort to reduce the spread of COVID-19, people were required to quarantine. Teachers worldwide had never prepared to provide a remote/hybrid learning experience for students. Challenges to learn how to use technology tools to instruct in a mode that had not been widely used by educators, provided a large learning curb

for teachers, students, and families.

Across all of these themes teachers were able to integrate technology into their instruction, reach out to parents in efforts for partnership, as well as to focus on student learning throughout the pandemic. Working with colleges as a support system was one of the ways in which they navigated this shift in instruction.

Throughout the interview process teachers indicated their hardships during remote/hybrid learning that included, the amount of time it took to plan and provide resources and feedback for students, the importance they saw in educating students in person, expressing the uncertainty that was happening during this time in terms of safety and health measures, viewing technology as a hinderance that can be perceived as a toy, indicating that technology use was not age appropriate for students who are very young, as well as students lacking social skills due to limited in person social interaction.

Unexpected Outcomes

There were two notable unexpected findings in this study. One is the elaboration of habits teachers continued from remote/hybrid teaching and the other deals with teachers engaging in conversations and decisions of technology integration to enhance curriculum. Hodges et al. (2020) explained the purpose of Emergency Remote Teaching (ERT) as a temporary delivery mode of instruction due to a crisis. When a crisis has become less intensified, the instructional format will return after the crisis has subsided. Teachers applied what they knew from their everyday work to an extraordinary situation. However, to elaborate on a certain portion of this understanding of ERT, teachers did return to a face-to-face format, but did express throughout the course of the interviews an increase in technology skills, the continued use of resources and instructional strategies utilized during remote learning. Some participants expressed the

continued use of digital presentations, the utilization of the Google Classroom for sharing instructional resources, and maintaining messaging communications with parents via a messaging system or video conference call. Ottenbreit-Leftwich et al. (2010) indicated that teacher values were rarely included in conversations and decisions about technology integration practices that enhance curriculum. This information does not align with the participant interviews of this study. Teacher interviews in this study indicated being able to take part in conversations and decision making resulting in how they would integrate technology during remote/hybrid learning. Due to the growth of abundance in technology and the unexpected mode of teaching with technology during remote/hybrid learning, this finding may be considered reasonable to the situation.

Limitations

The results of this study had numerous limitations. First, the informants from this study were teachers from one school district and at a select number of schools. This means information was limited to teachers from the selected school sites with a different number of participants from each site. Second, teachers who agreed to be interviewed in the study taught in a K-6 setting, but may not have taught these grade levels during the time of the interview. Third, the participants came from various ranges in years of teaching experience. Fourth, the data was collected approximately two years after the onset of remote and/or hybrid instruction. Fifth, the amount of interview time allotted may have affected the responses provided by the teachers and the time of day may have affected the teacher to focus on responses to the researcher, whether it be before, during, or after school hours. Sixth, all participants but one were female, which may have limited the generalizability. Finally, only one researcher analyzed the interview data. This

limited the data to the understanding of the researcher and the researchers' biases operating under the guidance of data collection and analysis procedures by published experts.

Implication of the Results

Educators should collaborate with their colleagues to engage in conversations, reflections, and discuss next steps in student learning as well as their next steps in teacher practices, values, beliefs, and habits that support student learning and ensure they are aware of their perceptions on what students are able to achieve. Teachers should be mindful of continuing to utilize technology that would support providing resources to students and parents as well as maintain communication and partnership focused on student learning. Teachers should be deliberate in providing a digital learning environment that would assist in contributing to a culture of learning that fosters self-directed learning experiences, student autonomy, self-efficacy, as well as a social constructivist learning environment that fosters collective efficacy.

Further, parents/guardians best practices can include the need to have resources available for students to continue their learning outside of the classroom setting, as well as providing accessibility to parents to view these resources to support student learning. Parent/teacher partnership can continue to use technology as a tool to facilitate student learning and provide a pathway to learning resources and communication. School administrators can provide support and encouragement to teachers in their understanding of utilizing content knowledge, pedagogy, and technology skills to support student learning as well as utilize technology as a media that can support teachers, students, and parents as a resource to continue to learn and communicate.

Finally, teacher preparedness programs should gain information from the experiences of teachers who taught during remote/hybrid teaching to determine lessons learned, skills gained,

and resources that were used. Suggestions gained from educators can help educate those who decided to join the field of education.

Recommendations for Further Research

Considering the limitations of this study that have been identified, the following are recommendations for further research. More research from other teachers from more schools/districts are needed. As teachers could have had varying differences in experiences. Recommendations for further research include focusing on teacher collective efficacy. One of the most pronounced themes dealt with teachers indicating the importance of collaborating with peers. These teachers indicated the importance of utilizing their peers to maneuver through the pandemic. Further research on teacher learning experiences through collective efficacy can assist with providing reflection on the outcomes they see for students as they prepare them for a life outside of their classrooms.

Further research should explore the student perspective of learning in a remote/hybrid environment. Specifically, focusing on the student experience, student mindset, readiness for self-directed learning, perseverance, student agency, and student autonomy. Providing additional research would help to contribute information from the student perspective, as well as provide educators information to support students to achieve the life conditions they seek.

Conclusion

This study explored the impact of the rapid shift to remote and hybrid instruction on the teacher dispositions of K-6 public school teachers providing remote and in-person instruction toward technology integration during the ongoing COVID-19 pandemic in Arizona. The COVID-19 pandemic affected teacher dispositions regarding technology integration in five ways, including teachers seeing students as capable, valuing parent/ teacher partnership, and

working collaboratively with their peer educators. Future research is needed regarding collecting more information from teachers from various schools regarding collaboration, as well as collecting information from students on their experiences from a student perspective. Educators should continue to grow professionally in learning about student content, pedagogy, and technology as well as how these components interact to provide students with experiences to prepare them for the digital age of learning.

Millions of students and educators went home on a March afternoon in 2020 believing that they would be returning to school in two weeks. For many, a return did not occur until more than a year later. A lesson that can be learned from that experience and further emphasized by this research is that educators should be building technology integration regularly throughout instruction. Further educators should foster student learning dispositions to bolster the growth mindsets of students such that they can face academic challenges and the unforeseen challenges that are guaranteed to encounter these students in this ever-evolving world. Still, a greater lesson that can be learned from this study is that challenges come in different forms and scales in which student need to be prepared: These challenges may not be in the form of a global pandemic, but may be in the form of challenges in jobs, careers, education, finance and other life experiences.

Personal Growth and Learning

As an educator a call to action would be to ensure we act in a way that aligns with our values and beliefs of providing students with the best possible outcomes they seek for their life as well as being a facilitator or mentor of learning.

As a doctoral student who has finished this dissertation, the final thought on this research is that I am optimistic that through teacher reflection on the lessons they learned during the pandemic, they may see a value in the use of technology integration that would encourage

parent/teacher partnership as well as use technology as a tool to facilitate student learning and foster a digital and in person environment that cultivates student agency.

What I learned from these participants is their commitment to student learning. They expressed their work efforts they put into place to connect with their students and families amid their own personal lives during the pandemic. They expressed using different strategies, resources, and efforts put forth, many of which continued beyond a normal workday. What stood out as one of the most prevalent attributes is their relentless effort to support students and families.

As a call to action in which I want to hold myself accountable is to ensure my actions are guided by values and beliefs in the interest of student agency, where students will not be limited to people's perceived judgment of their capability but by a boundless belief of self-efficacy in which they will actively move their learning forward to have an influence on the life circumstances they seek for themselves and others.

Summary

Chapter five provides the conclusion and recommendations of the study on how the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching. The following sections are included: Discussion of the results in relation to the literature, limitations, implications of the results, recommendations for further research, conclusion, and a final reflection of personal growth and learning.

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APPENDICES

Appendix A: Email Letter to School Leadership Team

School Leadership Team,

My name is Veronica Ortega, and I am a doctoral student from Northern Arizona University in the Curriculum and Instruction Program. I am conducting a research study as part of the requirements to complete my doctoral dissertation. I have received permission from your school district and site principal to conduct my research within your school site. I am contacting you to ask for your assistance in reaching out to your staff about their participation in the study. I am conducting my dissertation research on understanding teacher dispositions to use technology during the COVID-19 Pandemic.

Teacher participation involves an interview that would take approximately 1 hour. After the interview, teachers may be contacted to provide feedback on the research findings along with a one-week period in which participants can reply with feedback. Teachers will be invited to share any artifacts regarding their teaching in the pandemic they wish. (Artifacts should not include student work or student identifiable information, as it is protected under FERPA.) Teacher responses to the interview will help understand teacher dispositions to integrate technology in a remote and/or hybrid learning environment during the COVID-19 pandemic.

I would like to set up a time with you to answer any questions and discuss potentially meeting with your staff at an upcoming staff meeting. At the time of this staff meeting, I will ask you to distribute an email to your staff that would provide details of the research, along with a criteria to participate in the study, form of consent, information on confidentiality, and a scheduling form to elect a date and time for the interview.

Thank you for your time,

Veronica Ortega

Appendix B: Email Invitation to Teachers

Hello Teachers,

My name is Veronica Ortega, and I am a doctoral student from Northern Arizona University in the Curriculum and Instruction Program. I am conducting a research study as part of the requirements to complete my doctoral dissertation. I am conducting my dissertation research on understanding teacher dispositions to use technology during the COVID-19 Pandemic.

I am inviting you to participate in this study. Your participation involves an interview (via video conference) that would take approximately 1 hour. After the interview, you may be contacted to provide feedback on the research findings along with a one-week period in which you can reply if you choose. You will be invited to share any artifacts regarding your teaching in the pandemic you wish. (Artifacts should not include student work or student identifiable information, as it is protected under FERPA.) Your response to the interview will help understand teacher dispositions to integrate technology in a remote and/or hybrid learning environment during the COVID-19 pandemic. Your participation in this study will help contribute to the existing research in the field of education and assist me in completing my dissertation.

Click on the "NEXT" button to read the participation criteria, consent form, and information on confidentiality.

Please sign the consent form and select a date/time for an interview if you agree to participate.

Thank you for your time,

Veronica Ortega

Appendix C: Teacher Consent



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Project Number: 1578023-1
Approval Date: November 14, 2022
This stamp must be on all
consenting documents



Consent to Participate in Research

Study Title: The Impact of the Rapid Shift To Remote and Hybrid Instruction on the Teacher Dispositions of K-6 Public School Teachers During The Covid-19 Pandemic

Principal Investigator: Veronica Ortega

You are being asked to participate in a research study. Your participation in this research study is voluntary and you do not have to participate. This document contains important information about this study and what to expect if you decide to participate. Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate.

The purpose of this qualitative case study is to explore the impact of the rapid shift to remote and hybrid instruction on the teacher dispositions of K-6 public school teachers providing remote and/or hybrid instruction toward technology integration during the ongoing COVID-19 pandemic in Arizona. Teacher participation involves an interview that would take approximately 1 hour. After the interview, you may be contacted to provide feedback on the research findings along with a one-week period in which you can reply if you choose. Teachers will be invited to share any artifacts regarding their teaching in the pandemic they wish. (Artifacts should not include student work, or student identifiable information as it is protected under FERPA.)

The participants of this study are kindergarten through sixth grade teachers who having been teaching during the ongoing COVID-19 pandemic, specifically those that meet the following inclusion criteria:

- (A) They have been a part time or full-time employee certified to teach in any grades from Kinder-6th grade;
- (B) They taught at least one semester before March of 2020;
- (C) They taught any time between March 9th, 2020, and December 18th, 2020;
- (D) They taught in modalities that include remote or hybrid instruction; and
- (E) They have remained in the same school district which is the case.

There are no expected risks to you as a result of participating in this study. You will not benefit directly from participating in this study. There is a time commitment of approximately 1 hour for the interview and any additional time if you choose to share artifacts and provide feedback to the findings of the study.

Participants will be identified by a participant pseudonym that will be assigned to the participant in order for responses to be confidential. Identifiable information will not be shared with other researchers or used for future research. Data and recordings will be kept private through password protection or locked access. The researcher password will not be shared with anyone.

NAU Adult Consent Non-Federally Funded

V Mar 2020

Consent Version: 11/14/2022

Page 1 of 3



Office of Research Compliance

No one outside of the researcher will have access to data or the recordings unless a transcription service is utilized. If so, a nondisclosure agreement will be signed by the transcription provider.

The results of this study may be used in reports, presentations, or publications but participant names will not be used. Identifiable research data will be password protected and the researcher will be the only person with access. When the study is completed and the data has been analyzed, identifiable research data will be destroyed or deleted.

With your permission, I would like to audio record and video record this interview so that I can have an accurate transcript. Once I have the transcript, and have coded the interview, and I no longer need the recordings for this research study, I will erase the recordings. Your name will not be in the transcript or my notes. Any personally identifiable information will be removed or modified to protect participants from being identified. Your name will not be collected or linked to your answers. Because of the nature of the data, it may be possible to deduce your identity; however, there will be no attempt to do so and your data will be reported in a way that will not identify you. Participants can withdraw from the research study at any time without penalty and can choose to not answer questions from the research study they do not feel comfortable answering. The information that you provide in the study will be handled confidentially. However, there may be circumstances where this information must be released or shared as required by law. Northern Arizona University Institutional Review Board may review the research records for monitoring purposes.

For questions, concerns, or complaints about the study you may contact the principal investigator Veronica Ortega at v13@nau.edu. Alternatively, you may contact her research supervisor Dr. Shadow Armfield at Shadow.Armfield@nau.edu.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact the Human Research Protection Program at 928-523-9551 or online at <http://nau.edu/Research/Compliance/Human-Research/Welcome/>.

AGREEMENT TO PARTICIPATE

I have read (or someone has read to me) this form, and I am aware that I am being asked to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I affirm that I am at least 18 years of age and voluntarily agree to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of subject

Signature of subject

Date



Project Number: 1578023-1
Approval Date: November 14, 2022
This stamp must be on all
consenting documents



Office of Research Compliance

AGREEMENT TO BE AUDIO RECORDED

Subject Signature: _____ Date: _____

AGREEMENT TO BE VIDEO RECORDED

Subject Signature: _____ Date: _____

Appendix D: Interview Protocol

Researcher (R): Hello, my name is Veronica Ortega. I am an Ed.D. candidate at Northern Arizona University. I am inviting you to participate in a descriptive case study on understanding teacher dispositions to use technology during the COVID-19 pandemic. Thank you for taking the time to participate in this study. Throughout this descriptive case study, you will be identified by a participant number or pseudonym that I will assign to you in order for your responses to be confidential.

I will be recording this interview and must keep a transcript of the recording for a minimum of five years. This interview will be transcribed. After the interview, you may be contacted to provide feedback on the research findings along with a one-week period in which you can reply if you choose. In addition, I will keep the interview information in a password-protected drive used for research and an external drive, which will be secured in a locked file cabinet in which I will be the only key holder.

This interview is expected to take no longer than 1 hour, and the time length will vary based on your responses to the questions. You will be invited to share any artifacts regarding your teaching in the pandemic you wish. (Artifacts should not include student work or student identifiable information, as it is protected under FERPA.)

Before we begin the interview, I would like to inform you that participating in this study is voluntary; therefore, you can stop participating at any time. You have the right to decide not to answer any questions. If you decide to stop participation, your data will be destroyed or deleted and will not be used in this study. I recommend that you answer the questions to the best of your ability. If you feel that you are experiencing discomfort, please inform me, and I will stop the interview.

You have the right to withdraw participation from this study at any time. In order to withdraw, you need to notify me that you no longer wish to be part of the study and that you would like all data associated with you destroyed or deleted, including your audio/video recording, and not used in this study. When this notification is received, I will destroy or delete all data collected from you. I will take this time to ensure you have signed a participant agreement. Please let me know if you have any questions about the agreement.

I would like to begin our interview. Do you have any questions before we begin?

<Wait for participant response>

Do I have your consent to start recording?
<Wait for participant response>
Great. It is recording.

I will start by asking you a few questions about your experience with teaching.

Protocol Note

The researcher will adapt her interview question selection based upon her interactions with the interviewee.

RQ1. How has the COVID-19 pandemic affected teachers' dispositions to integrate technology during the rapid shift to remote and hybrid teaching?

Introductory Questions

1. How long have you been teaching?
2. Tell me about the grade and content area you were teaching before the pandemic?
3. Tell me about your shift to remote and/or hybrid instruction during the COVID-19 pandemic?

Technology Knowledge (TK)

4. How do you feel your technology knowledge has changed as a result of the pandemic?
 - a. What new technology knowledge did you gain as a result of the pandemic?
 - b. What existing knowledge about technology helped you during the pandemic?
 - c. How have your values and beliefs about technology knowledge changed as a result of the pandemic?
 - d. What new habits and beliefs developed from using technology during remote and/or hybrid instruction.

Pedagogical Knowledge (P)

5. Tell me your view on how students learn?
 - a. How did your view on how students learn change as a result of the pandemic?
 - b. How have your values and beliefs about how students learn changed as a result of the pandemic?

Content Knowledge (CK)

6. How do you feel your content knowledge has changed as a result of the pandemic?
 - a. What new content knowledge did you gain as a result of the pandemic?

- b. What existing content knowledge helped you during the pandemic?
- c. How have your values, beliefs and/or habits about your content knowledge changed as a result of the pandemic?

Technological Pedagogical Knowledge (TPK)

- 7. How do you feel your view of how students learn through technology changed as a result of the pandemic?
 - a. How did student learning using technology change as a result of the pandemic?
 - b. How have your values and beliefs about how students learn using technology change as a result of the pandemic?

Pedagogical Content Knowledge (PCK)

- 8. How do you feel your view of how students learn about your specific content area has changed as a result of the pandemic?
 - a. How did student learning in your content area change as a result of the pandemic?
 - b. How have your values and beliefs about how students learn in your content area change as a result of the pandemic?

Technological Content Knowledge (TCK)

- 9. How do you feel your technology knowledge related to your content area has changed as a result of the pandemic?
 - a. What new knowledge about technology in your content area did you gain as a result of the pandemic?
 - b. What existing knowledge about technology in your content area helped you during the pandemic?
 - c. How have your values, beliefs and habits dealing with technology in your content area changed as a result of the pandemic?

Technological Pedagogical Content Knowledge (TPACK)

- 10. How do you think technology, student learning, and content knowledge relate to one another?
 - a. How did the pandemic change this?
 - b. What didn't the pandemic change about this?

Contextual Knowledge (XK)

- 11. How has the pandemic changed your opinion of your school, district, or state policies?
 - a. How has the pandemic changed your opinion of the federal government policies?

12. Is there anything else you would like to add that I did not ask you?

As part of my research I am collecting artifacts during the transition to remote and/or hybrid instruction during the pandemic. Would you mind sharing ?

Thank you for your time. I am going to stop the recording.

Appendix E: Copyright Permission

Wed, Aug 31, 2022 at 7:27 AM

Hello Veronica,

The Florida Center for Instructional Technology (FCIT) at the University of South Florida is pleased to grant you non-exclusive permission to include the Technology Integration Matrix of Summary Descriptors as it appears on our web site (fcit.usf.edu/matrix/) for the purpose of using it in your dissertation. By accepting this permission, you agree to include the credit "The Florida Center for Instructional Technology, fcit.usf.edu" in all forms of publication/production.

We would be happy to meet with you to discuss how to reference this table for you. If that's something you would like to do, let me know your availability for the next couple of weeks and I can schedule out a time for us to meet!

For a comprehensive description of the TIM model, we recommend using Harmes, et al, 2019, which I have attached for your convenience. Here is the citation information:

Harmes, J. C., Welsh, J. L., & Winkelman, R. J. (2016). A framework for defining and evaluating technology integration in the instruction of real-world skills. In S. Ferrara, Y. Rosen, & M. Tager (Eds.), *Handbook of research on technology tools for real-world skill development* (pp. 137-162). Hershey, PA: IGI Global.

Best,

Nate

--

Nate Hogan

Client Operations Manager, FCIT

College of Education, University of South Florida

<http://fcit.usf.edu>



The Florida Center for Instructional Technology provides professional learning, digital content, and technology integration evaluation services to schools and districts worldwide.

Date: Saturday, August 27, 2022 at 9:08 PM

To: TIM@fcit.us <TIM@fcit.us>

Subject: TIM Matrix Request for Permission

To Whom it May Concern,

I am a doctoral student from Northern Arizona University. I am writing to request permission to include the TIM Matrix Table of Summary Descriptors in my dissertation.

The Technology Integration Matrix Table of Summary Descriptors

https://fcit.usf.edu/matrix/wp-content/uploads/2019/05/2019_TIM_Summary_Descriptors_Portrait_Color-US.pdf

The focus of the dissertation is not on the TIM Matrix, however I do introduce it as one of several theoretical approaches to Technology Integration.

Thank you for your consideration,

Veronica Ortega