5-2024

The Lived Experiences of K-12 Instructional Technology Leaders During Covid-19

Robin Jackson

THE LIVED EXPERIENCES OF K-12 INSTRUCTIONAL TECHNOLOGY LEADERS DURING COVID-19

by

Robin Michelle Jackson

A Dissertation
Submitted to the Graduate School,
the College of Business and Economic Development
and the School of Leadership
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

Approved by:

Dr. Shuyan Wang, Committee Chair
Dr. Jonathan Beedle
Dr. Masha Krsmanovic
Dr. Holly Foster

May 2024

Published by the Graduate School

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

ABSTRACT

This study examines the lived experiences of K-12 Instructional Technology Leaders in rural schools and school districts throughout Mississippi. It sought to explore the challenges that were encountered, the strategies they were employed, and the lessons that were learned during the COVID-19 pandemic, as traditional classroom teaching and learning was abruptly transitioned to 100% online or remote teaching and learning. Five participants were recruited. Only one participant holds the actual title of an instructional technology leader of their school district, while the other four assumed the role and responsibilities of an instructional technology leader for their schools or school districts. Employing a qualitative research design, this study obtained data Through participant interviews and applied descriptive data analysis to extract meaning from responses.

Key findings regarding their experiences based on the Future Ready Technology Leaders™ (FRTL™) include: Advocacy for technology integration into curriculum, instruction, and assessment; Promotion of personalized professional learning to enhance technology use among teachers, students, and parents; Leverage of existing infrastructure for a smooth transition to remote learning; Rarity of challenges in securing the budget and resources; Promotion of student-centered teaching and learning through community partnerships; Consideration of data and privacy issues; Support for effective use of space and time for student-centered learning through technology use; and Encouragement of technology adoption and integration through collaborative leadership

Key findings regarding the barriers instructional technologists experienced during the COVID-19 pandemic include: Greater infrastructure challenges in remote (in-home) learning environments; Teacher resistance to technology use in curriculum, instruction,

and assessment; Teacher unpreparedness for technology and the increased demand for personalized professional learning due to COVID-19; and Elevated concerns about data and privacy during the rapid transition to remote learning.

Key findings regarding the lessons learned by instructional technologists include: Streamlining technology infrastructure; Providing opportunities for personalized professional learning; Considering student learning needs when planning instruction; and Embracing and adapting to the changes that comes with technology implementation; and Maintaining a student-centered approach to technology integration.

ACKNOWLEDGEMENTS

I wish to extend my heartfelt thanks and gratitude to all those who provided encouragement, unwavering support, and continuous guidance that were instrumental in achieving this academic milestone. First, I acknowledge and give praise to the Lord God Almighty, Jesus Christ-who is my strength and my redeemer, for leading me along still waters while providing me with strength, understanding and perseverance throughout this rigorous journey. All praise, honor, and glory belong to Him! Second, I would like to thank Dr. Jeanne Gillespie. It was through her style of teaching that I first believed that even "*I*" could attain a graduate degree. Next, I would like to thank Dr. Taralynn Hartsell and Dr. Lilian Hill for their encouragement, and guidance that propelled me forward through some of my most challenging times. Additionally, I thank my committee chair and advisor, Dr. Shuyan Wang, for her sacrifice, commitment, and years of wisdom that she has shared with me. To my esteemed committee members, Dr. Holly Foster, Dr. Masha Krsmanovic, and Dr. Jonathan Beedle, thanks for your willingness to contribute your profound expertise over the years while I navigated throughout the levels of this process. To Dr. Zita Tiamuh and Dr. Maureen Kperogi, thanks for believing in me and for pouring into me while always reminding me to never give up. Thanks for being real! I would also like to acknowledge my research participants for their contributions.

Finally, I would like to acknowledge the contributions of my family and dearest friends. Their unwavering love, support, and encouragement provided me with the emotional sustenance necessary to persevere through the intellectual and physical demands of this unique endeavor.

To my husband, Tony, thank you for believing in me, encouraging me and for being patient with me. You're one of my biggest cheerleaders! To my children; Jakevin, Dr. La'Daija, and Tyree, thanks for loving me and supporting me unconditionally. From 1997 until now, you all have changed my life immensely. I'm better because of you three. To my bonus children; Haleema and Savion and my bonus grandchildren; Nailah and Trace, thanks for allowing me to express my love, care, and concern for you. To my sister, Jessica and my nephew, Jordan, thanks for always being so supportive. To my dearest Aunt Gwen, you mean the world to me. Thank you for always pushing me beyond what I see, even as a child you made me believe I could be and do anything I could dream of. Thank you for always being so supportive and having my back. Aunt Jeannine, it's because of your text messages that I made it through many late nights of writing. One text in particular, "*Not by Might, Nor by Power, but by Your spirit, God, send Your spirit, God…We stand in awe of You*." Thank you. And to my Uncle Jerry and Aunt Marian, you two are the epitome of the love and support I could have ever received throughout this process and in life. Thank you for the countless late night phone calls when all we did was pray. Thanks for praying me through this venture and thanks for *always* seeing about me and my family. I love each of you!

To my extended family and friends, thank you for believing in me and encouraging me every step of the way! I would be remiss if I didn't acknowledge Eugene and Tanya Beard. In 2013, you two planted the seed of "*Dr. Ro.*" Thanks for placing that name into the atmosphere. Finally, I am here… I made it!

The race is not given to the swift or to the strong but to the one who endures to the end...

Ecclesiastes 9:11

DEDICATION

I dedicate this dissertation to my beloved, departed family members, and in their loving memories. Among them are my late mother, Joann Jackson Evans, and father, Robert Mitchell Evans, both of whom I miss and mourn daily. There are not enough words in the English language that could express the voids in my heart. I find comfort in knowing that being *absent from the body is present with the Lord*. May they continue to rest peacefully in all eternity. Their beautiful memories have been a guiding light, and warmth to my heart during the most challenging moments of this academic pursuit. I am forever grateful for everything my parents taught me in life. My prayer is that God enables me to do the same and more for my children, grandchildren, and for the rest of my family and friends.

This dedication serves to honor my esteemed, late family members and parents, encapsulating the profound love they instilled in me, their indelible influence in shaping my character, and the cherished memories we shared as a family. While they are not here to share this moment with me, I am certain that their spirits rejoice in the culmination of my journey and the attainment of my Doctor of Philosophy degree.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I – INTRODUCTION

Background

The Coronavirus pandemic (COVID-19) has presented many unprecedented challenges globally, forcing the need for emergency adjustments for not only our medical/health industries and economies, but also all levels of education for all people, in all nations. School closures began in Europe and in Asia. Teaching and learning transitioned from the traditional classroom setting to remote learning overnight (Quesada et al., 2020). According to the United Nations Children's Fund (UNICEF) and United Nations Educational, Scientific and Cultural Organization (UNESCO) there were over 290 million students that had been affected by school closures across the globe. By June 2020, 1.725 billion students in 193 countries had been affected by school closures (UNESCO, 2020). The overarching need at all educational levels was to quickly transition from the traditional classroom setting to remote (at home) teaching and learning. In the United States, state education departments, state health organizations, and state education licensing agencies collectively developed and disseminated COVID-19 guidelines designed to help meet the urgent needs of each school, as they continued to educate each student with minimal disruption (Hale et al., 2020), as safety and health issues were vague but vitally important. This abrupt change to distance learning burdened many schools, families, and students at all levels of education.

Implementing remote learning on such a large scale in such a short time revealed many difficulties in technological infrastructures for many schools (Brom et al., 2020). This has led to increased pressure to ensure instructional technology (IT) infrastructure can support teaching and learning effectively. Addressing these difficulties has been a

focal point of concern for instructional technology leaders in K-12 education during COVID-19 pandemic (Black et al., 2020) as many schools raced to implementing online teaching and learning at a rapid pace (Jordan, 2020). Furthermore, schools in rural areas have faced additional challenges in making this transition due to limited access to resources.

Instructional technology, which is often referred to as educational technology, is the field concerned with the design, development, implementation, and evaluation of goal oriented problem-solving systems. Educational technology and instructional technology both share the similarities of focusing on enhancing teaching and learning strategies through the implementation of technology and use. In difference, educational technology includes a broader scope of philosophical approaches of using technology to support education, and instructional technology includes a more focused implementation strategies for instruction (Gagne, 2013). Additionally, instructional technology provides a systematic way to leverage and facilitate different aspects of teaching and learning that effectively and efficiently transform educational practices while contributing to societal change (Corbeil, 2013). The various functions of instructional technology leaders include, but are not limited to, 1) planning and developing e-learning policies and procedures, 2) designing the layout of computer labs and/or technology resource centers, 3) training teaching personnel, and 4) managing technology software (Asamoah, 2021). In the K-12 educational settings, instructional technology leaders are also responsible for implementing technology tools in their school districts. For example, to help influence educational systems using technology, instructional technology leaders help teachers use

Microsoft Office, Google Suite, and social media outlets such as Facebook Groups in classroom teaching (Williamson, 2020).

Furthermore, the role of instructional technology leaders take shape in various forms across schools and school districts such as instructional designer, instructional specialist, and instructional technologist. Although some may possess the title of instructional technologists, others may assume secondary roles by which they are involved in making decisions about the implementation and management of technology in the learning environment. For example, the duties of an Academic Coach might involve training and supporting teachers in the use of technology for instructional delivery (Miller, 2021).

According to Reimers et al. (2020), education leaders must take quick actions to design tailored responses to issues concerning teaching and learning during the COVID-19 pandemic. Common challenges faced by instructional technology leaders align with strategic initiatives for educational practice as outlined by Alliance for Excellent Education (2017). These include 1) restructuring curriculum design through leveraging technology infrastructure (Borup et al., 2020), 2) ensuring equitable access to digital/technology resources for learners (Lee, 2020), 3) securing funding needed to acquire technology resources (state/federal, learner internet connectivity issues) (Crosby et al., 2020), 4) engaging students and parental involvement in learning (Rashid & Asghar, 2016), 5) academic integrity, data and privacy concerns (Gamage et al., 2020), and 6) professional development and training of teachers to teach remotely (Sterrett & Richardson, 2020). Particularly, at the primary education level, the shift to remote learning has increased students' dependencies on teachers (Gamage et al., 2020).

During the beginning of the pandemic, schools saw a rapid restructuring of curriculum design and delivery from traditional classroom instruction to complete virtual or remote instruction. Instructional technology leaders were faced with identifying effective strategies for supporting remote learning (Royals, 2020). According to a survey conducted by American Enterprise Institute (2020), most of a representative sample of 250 public school districts had published an instructional plan on their websites. Also, more than 40% of schools had implemented a plan for distance learning, while 30% of schools had provided students with teacher-facilitated learning. Approximately, 40% of the public schools were in districts that supported remote learning using supplemental content in the form of links to open educational resources with voluntary participation of their use by students. On the other hand, 34 % of public schools provided students with instructional packets which included electronic or hard copies of instructional materials for students to complete at home. Further, 28% of schools implemented asynchronous and synchronous web-based resources for the exchange of learning materials and assignments between teachers and students.

Furthermore, instructional technology leaders addressed issues of equity and student access and use of educational technology resources, a digital divide. According to Moore et al. (2018), it "is the gap between people who have sufficient knowledge of and access to technology and those who do not." (p. 1). This digital divide, which was especially prevalent among families of low-socioeconomic and those living in poverty regions (Jordan, 2020) can further increase the disparities experienced by these underserved groups (Moore et al., 2018). The pandemic highlighted a digital divide concerning access to learning technology resources among institutions across the nation,

including those in rural regions in Mississippi (Harris, 2020; Royals, 2020). Institutions were forced to evaluate their budgetary capacities which revealed their urgent financial needs as it relates to supporting curriculum and securing funding needed to acquire technology resources (state/federal, learner internet connectivity issues) (Harris, 2020). States implemented efforts to address the equity and divide issue through federally backed million-dollar investments to fund technology purchases, internet/broadband connectivity, and educator training and professional development (Harris, 2020; Royals, 2020)

For example, legislation in Mississippi was enacted that allocated $200 million that provided support to schools to implement virtual learning. Of those funds, 75% were allocated toward the purchase of technological devices and the remaining assigned toward supporting infrastructures for broadband and internet delivery (Royals, 2020). From these investments, by November 2020, over 40,000 devices were allocated to students in Mississippi (Wright, 2020).

Mississippi has a history of being underfunded and lagging in resources that support educational processes and outcomes (Showalter et al., 2019). During the pandemic, the rapid deployment of funds to provide technologies to support the continuation of academic functions across Mississippi public school districts was especially critical. According to a report published by the Rural School and Community Trust (Showalter et al., 2019), "Why Rural Matters," 50% of students in Mississippi live in rural areas, therefore, there needs to be a high priority focus on improving educational outcomes in this region. Mississippi rural school districts are disadvantaged in several areas compared to rural school districts in most states as it relates to higher rates of

students in poverty, lower expenditures per student, and higher high school graduation attrition rates (Showalter et al., 2019). Across the nation, the pandemic further heightened existing deficiencies in the equity, access, and use of technological resources among families in rural school districts.

Often, these poverty regions are situated in rural areas, with school districts in these areas facing disproportionate challenges related to disruptions to internet connectivity (Royals, 2020). To off-set the challenge that many families faced by not having adequate technology tools in their homes, some school districts provided free televised broadcasts through local news stations and through Broadcast Mississippi's Best Education which is transmitted via radio or cable television, or a digital television antenna to families in hopes of bridging that gap (Gipson, 2020). However, due to many families that live in impoverished and rural areas, those students could not view those broadcasts (Soares et al., 2020). These have raised significant concerns for instructional technology leaders regarding issues of equity and access to learning technology resources for learners in remote environments (Warschauer et al., 2014).

Student engagement in remote learning

According to the literature many students have portrayed various levels of low motivation for learning (Hakim, 2020). Some K-12 sectors also reported that even in the event of having adequate technology resources, teachers were reporting increasing number of students who were either disengaged or the teachers were experiencing trouble while maintaining student-teacher communication during online instruction (Farooq et al., 2020). In addition to this, parental involvement in supporting students in remote learning presented a challenge due to lack of parent's ability or knowledge in helping to

scaffold student learning of content (Rashid & Asghar, 2016). This led to a need for technology leaders to identify ways to bridge the gap between parental involvement and student engagement in the remote learning environment (Black et al., 2020). While addressing issues of low engagement among students, schools have also been faced with a rise in incidents of student academic integrity brought on by the increase in online learning (Kaup et al., 2020).

Student academic integrity

Recent studies have revealed that one of the most important challenges amid the COVID-19 pandemic is the quality of academic integrity (Giri & Dutta, 2021). According to the International Center for Academic Integrity (2014), although student evaluations and assessments are available online or through take-home assignments, some instances warrant a concern of academic integrity. This is especially the case for state tests, as well as college-level entrance exams that have been temporarily canceled or suspended due to the pandemic (Kelum et al., 2020). In K-12 education, academic integrity is concerned with students' dishonest behaviors. With the numerous amounts of free online resources and predatory companies that provide products or services there is no clear regulation in restrictions to the extent of learning materials and content that students have access to that could support students' actions of plagiarism or academic integrity. Therefore, instructional technology leaders must keep strategies to minimize deviances to academic integrity at the forefront.

Data and privacy

In addition to issues of student academic integrity, during the pandemic schools had to address concerns related to data and privacy of educational resources used to

support teaching and learning. According to Huang et al. (2020), more emphasis and more research should be placed in utilizing open educational practices (OEP) and open educational resources (OER) in efforts to overcome the educational challenges that were revealed during the wake of COVID-19. These provide low-cost to free options to address budgetary constraints. However, this also raises concerns regarding the accuracy and privacy of data and information retrieved from open educational resources sources. School districts are urged to proceed with caution when adopting and implementing instructional technology tools in their schools. Additionally, since the era of the COVID-19 pandemic, evidence-based research has shown where various emerging open resource learning technologies have claimed to deliver promising results that are misleading (Butrymowicz & Mathewson, 2020). Research to support such claims are either invalid or weak. School administrators and instructional technology leaders must be aware of commercial advertising and marketing sources when it comes to making informed decisions about instructional technology programs to adopt in the school districts. In the meantime, according to Reeves and Lin (2020), one measure that should be considered when adopting instructional technology tools is using the research, guidance, and professional standards brought forth by instructional technology leaders or practitioners.

Technology adoption

According to Harris (2020), effective implementation of technology by schoolteachers and staff is contingent upon district leadership's efforts in providing professional development opportunities that promote school personnel's confidence and competence in adopting the use of technology to support learning. District leadership should take advantage of using both asynchronous and synchronous technology, as both

methods of technology can effectively be used as guidance when implementing technology as well as how the technology will be used. Asynchronous and synchronous technology can also be used to better understand the use of technology, while demonstrating the expectations of the technology (Harris, 2020). As technology is innovative and ever-changing, leaders guiding technology adoption in schools should address technology challenges by placing focus upon the problems that restrict technology implementation, as opposed to the solutions.

Statement of the problem

The push for technology integration in the classroom is not novel. This is evidenced by public policy, The National Education Technology Plan (NETP), that encourages technology integration in the classroom due to its effectiveness on student learning (Tondeur et al., 2017). During Spring 2020, K-12 educators in southeast Mississippi experienced massive digital shifts with implementing remote learning in their classrooms. Dibner et al. (2020) describes curriculum challenges faced by K-12 teachers during the transition to remote learning. These challenges include insufficient infrastructure, inequitable access to channel remote learning, institutional funding needs, student engagement and parental involvement. Additionally, with increased dependence on the use of instructional technologies, the authors raised concerns of academic integrity, and data and privacy and the need for teacher professional development and training (Dibner et al., 2020).

Furthermore, Tyler-Wood (2018), in their study of school environment and technology implementation in K-12 classrooms found that rural schools had less favorable conditions and support towards effective technology implementation, compared

to suburban schools. This was evident during the COVID-19 pandemic as there was a digital divide in implementing remote learning across K-12 schools in Mississippi (Royals, 2020). Many schools with students who lived in rural areas and in poverty often had little to no access to technology (Richardson et al., 2020). Instructional technology leaders were thus faced with the task of ensuring equitable access of digital learning and supporting educational goals. These translated to overcoming challenges related to curriculum instruction, planning infrastructures for future growth and innovation, funding, and resources, leveraging community partnerships, data and privacy issues, and innovations in remote teaching and learning (Cheng, 2020).

According to the literature, the pandemic resulted in both state and local mandates for school district leaders to develop strategies to equip school personnel to deploy technology effectively to support teaching and learning (Reich, 2020). Understanding the factors that support successful implementations of technology by teachers and staff is important to address challenges that are faced with financial constraints, adoption of technology, and student academic achievement during crisis events (Harris, 2020). Harris (2020) investigated factors that impact technology implementation in education. Using a quantitative approach with a sample size of 10,620 educators, Harris found that decisions made by district leaders regarding professional development influenced the confidence and proficiency of teachers and staff in effectively implementing technology during COVID-19 crisis. From these findings, Harris urged that future research should further examine the implementation of technology during a crisis using a qualitative approach to provide in-depth understanding of his quantitative findings and using a different sample population. Zhao et al. (2002) also indicated that there is a lack of research that examines

broad factors that influence technology integration. Meanwhile, the unexpected onset of COVID-19 pandemic has further increased the need for research investigations of its effects in education. Regarding lessons learned by schools and school districts during the rapid transition, Lowenthal et al. (2020), argued that future research is needed on strategies that institutions implemented that were effective in moving them forward and beyond and preparing them for future disruptions to education.

Purpose of the study

The purpose of this research study is to conduct an in-depth examination of the lived experiences of K-12 instructional technology leaders in rural school districts in Mississippi. It seeks to explore the challenges they encountered, the strategies they employed, and the lessons they learned during the COVID-19 pandemic when traditional classroom instruction transitioned to fully online instruction. The wake of disruptions to teaching and learning activities due to the pandemic in K-12 education, teachers and institutional leaders were forced to have to reimagine how to support students in achieving prescribed learning objectives and outcomes (Sharma & Bumb, 2021). Instructional technology leaders were at the forefront of working with institutional stakeholders to address these issues fashioning emergency management solutions and ensuring the future technology readiness of their schools. The abrupt transition to fully online leaning presented various challenges for instructional technology leaders. In their role of supporting teachers and instructional delivery, they faced challenges related to internet connectivity issues, infrastructure limitations, and, in some cases, teachers' lack of knowledge regarding technology-based pedagogy (Noor et al., 2020). These

challenges were even more prominent in rural regions in Mississippi, raising questions about the technology readiness of schools (Royals, 2020).

Research questions

The following research questions guide the current study:

RQ1: What are the lived experiences of instructional technologists during COVID-19 as it relates to various elements of educational practice on student-centered learning?

RQ2: What barriers did instructional technologists experience during the COVID-19 pandemic?

RQ3: What lessons were learned by instructional technologists as it relates to educational practices that align with the future readiness of their school?

Significance of study

Understanding the challenges encountered, the strategies employed, and documenting lessons learned from instructional technologist leaders during this period, could empower them to assume leadership roles in their professional practice. This allows them to continue leading their districts in supporting student-centered learning while adapting to societal impacts and/or digital divides. District-level and school administrators could gain insight into the types of support needed by instructional technology leaders to ensure that they can lead their districts toward preparing students for success through equitable access to digital resources and innovative learning environments.

By understanding the lived experiences of instructional technology leaders in rural schools as they address challenges brought by the pandemic, the findings of this study will inform the call for technology adoption to be based on research practices,

guidance, and professional standards (Reeves & Lin, 2020). The in-depth examination of instructional technology leaders' experiences in implementing educational technology practices will support the future readiness of their schools in achieving educational objectives. Stakeholders who will benefit from these findings include instructional technology leaders in developing professional practice for the future readiness of their schools. Additionally, administrative leaders will find value in formulating policies related to technology implementation and in supporting the needs of instructional technology leaders.

Conceptual framework

The conceptual framework for this study will be Future Ready Technology Leaders (FRTL™) framework (Alliance for Excellent Education, 2017). FRTL™ is appropriate because it addresses the strategic initiatives necessary for empowering leadership among instructional technology leaders, while emphasizing the need to close the digital divide gap and provide equitable access to innovative learning environments and technology resources for all students. Finally, it acknowledges school districts' need to support their instructional technologists and the need for a student-centered focus when implementing technology in the learning environment.

Following the emergence of COVID-19 in Spring 2020, K-12 instructional technologists were tasked with swiftly deploying and implementing strategies to support institutional teaching and learning objectives. Their challenges included addressing the absence of emergency preparedness, securing necessary funding, accommodating changes in the curriculum, fulfilling training requirements, and ensuring equitable access to technological resources (Black et al., 2020). Royals (2020) highlights that the digital

divide in K-12 education within Mississippi schools necessitates instructional technology leaders to ensure equitable access to digital learning. This is vital for overcoming challenges related to curriculum instruction, infrastructure planning for future growth and innovation, funding, and resource allocation, leveraging community partnerships, addressing data and privacy concerns, as well as fostering innovations in remote teaching and learning.

Dibner et al. (2020) emphasize the role of instructional technology leadership in fostering uninterrupted teaching and learning infrastructures, thereby enabling schools to progress towards future technology readiness, enhanced technological efficiency and effectiveness, and improved access within innovative learning environments.

Instructional technology leaders position their schools to leverage the use of innovative technology that supports learner-driven experiences and ensures equitable access to learning resources to achieve student learning goals. To do this, technology leaders should be empowered through professional practice. According to the FRTL™ framework, technology leaders support their schools or district's technology readiness goals through professional practice, policies, and procedures. Furthermore, the framework outlines principles across eight key areas that describe how technology leaders can support schools as they transition to digital learning and position themselves to become equipped to support technology infrastructure in the future. These principles take into consideration the various roles that technology leaders serve within their schools or school districts. The principles are based upon the core belief, "in a future ready school, all students deserve equitable access to qualify technology leaders, digital resources, and innovative learning environments" (Alliance for Excellent Education,

2017, p. 2). Alliance for Excellent Education's (2017) principles for future ready technology leaders for supporting student-centered learning across eight areas are described in detail in the following paragraphs.

Curriculum, instruction, and assessment (CIA)

Technology leaders can support student-centered learning through designing curriculum, instruction, and assessment that supports a rich digital learning environment. Through facilitating the design of academic content and instruction, these leaders ensure equity and access in learning opportunities and leverage the use of adaptive technologies, innovative tools, instructional methods, and resources. Furthermore, technology leaders develop opportunities, procedures, processes, and protocols that support the adoption and implementation of novel educational practices and resources to stimulate innovation.

Personalized professional learning

Technology leaders can support student-centered learning through engaging in personalized professional learning that develops opportunities for personal growth. Creating opportunities for professional growth is essential for technology leaders in their goal to support student-centered learning. Therefore, this requires the design and delivery of training opportunities to meet the various needs of staff. It also requires the development of a culture that is based upon trust and empowerment of instructional technology leaders. Additionally, technology leaders should leverage technical capacity among technology staff and develop partnerships with departments throughout the district.

Robust infrastructure

Technology leaders can support student-centered learning through innovation that aims to build a robust infrastructure. This requires leaders to use innovative thinking when planning future growth while making changes to the educational environment that support technology innovation. Additionally, technology leaders should remove barriers to effective teaching, ensure reliable access to all resources, and create and manage systems that ensure the availability of data to all stakeholders.

Budget and resources

Technology leaders can support student-centered learning by managing budgets and resources to create a sustainable digital learning environment. Leaders should identify resources needed by all learners and advocate for these. Simultaneously, formal review processes should be implemented regularly to assess technology resources and hardware updates and needs to ensure short term and long-term sustainability. Finally, sustainable resources should be allocated in a way that reinforces high-quality digital learning while simplifying the current infrastructure.

Community partnerships

Technology leaders can support student-centered learning through building community partnerships that expand learning beyond the school day. This involves establishing new and nurturing existing relationships with community members that focus on creating student learning opportunities and supporting their needs. In addition, technology leaders should organize learning events for community members and parents to support partnerships outside of the school day.

Data and privacy

Technology leaders can support student-centered learning through a focus on data and privacy initiatives that ensures data safety, security, and privacy. This can be accomplished through developing and reinforcing protocols that ensure student data and privacy as well as secure and implement robust safety, security, and tools. Furthermore, technology leaders should educate teachers and school staff in the areas of data security, data and privacy and the expectations, policies, and laws pertaining to data and privacy. The use of best practices through providing data visualization and predictive analytics can promote the use of data and digital fluency for all users.

Use of space and time

Technology leaders can support student-centered learning by leveraging space and time to foster anywhere, anytime learning. Technology leaders should advocate, design, and integrate infrastructures that allow flexible opportunities for learners to access technology in remote locations regardless of format, place, or time. The established infrastructure should support and ensure that all students and teachers have access to resources and tools needed for learning and teaching. Furthermore, technology leaders should implement access to learning opportunities for students in remote environments as needed.

Collaborative leadership

Technology leaders can support student-centered learning through collaborative leadership that envisions the future. Through collaborations with school and district leaders, technology leaders should aim to establish a shared vision of teaching and learning that focuses on technology as a vehicle to advance educational initiatives.

Furthermore, leaders should empower and encourage school and district leaders to adopt digital technology tools and to foster an innovative culture of safety and trust for all.

Delimitations and assumptions

Delimitations

Teachers and administrative leaders are all impacted by the digital shift to virtual/remote learning due to the COVID-19 pandemic. However, instructional technologists are directly responsible for the successful implementation of learning technologies to support teaching and learning in the schools. Therefore, their experiences provide a unique perspective for developing policies and identifying ways that schools and districts can ensure future technology readiness.

Participants are delimited to those from school districts in the state of Mississippi because Mississippi is known as a rural and under-connected state as it relates to access to connectivity (Royals, 2020). Amidst COVID-19, the state has been faced with a challenge and task of securing technology access to students, curriculum and professional development needed to support technology use (Royals, 2020).

Assumptions

An assumption of the current study is that participants' subjective experiences and interpretations of these experiences provide a view of the world and their reality. Furthermore, participants can provide an accurate account of their lived experiences.

Definitions of terms

The following are definitions of key terms that provide an understanding of the context of the study.

Instructional technology leaders: These include individuals in K-12 education that hold the following titles: technology director, instructional designer, instructional specialist, and/or instructional technologist. According to Karlin et al. (2018), these also include "technology coordinators, technology coaches, integration specialists, eLearning specialists, innovation specialists..." (para 7). In this study, these also refer to the teachers who share the responsibilities of instructional technology leaders but not necessarily have the title.

Future readiness technology leaders: Framework for understanding the actions and strategies that K-12 technology leaders can implement in their districts, schools, and among teachers and students to place student learning at the center of student success using technology (Alliance for Excellent Education, 2017).

Future ready schools: K-12 school's that have leveraged the capabilities and capacities of technology to implement student-centered learning through planning, preparing, analyzing student outcomes, focusing on teacher development, culture, and supporting technology leadership (Alliance for Excellent Education, 2017).

Remote learning: Learning that is not face-to-face in a traditional classroom setting and is referred to as distance learning, online learning, or virtual learning.

Instructional technology (or educational technology): Strategies implemented to guide the delivery, design, and implementation of instruction in a systematic way including the use of digital tools, media, and artifacts to achieve effective teaching and learning to foster positive student outcomes (Gagne, 2013).

COVID-19 pandemic: A world-wide pandemic/health crisis that was initiated by the spread of SARS-CoV-2 virus discovered in 2019. It forced an abrupt shift in instruction

and learning at all educational levels from traditional to remote classroom learning environments.

Digital divide: The onset of COVID-19 highlighted the necessity for closing the gap in equity and access to digital technology in K-12 schools and households. During the pandemic, federal, state, and local agencies contributed efforts toward closing this gap through funding provided to districts and schools with students from low-income housing and those living in rural areas (Gao & Hayes, 2022).

Infrastructure: A culmination of innovative teaching and learning tools such as desktops, laptops, and tablets are essential in transmitting the information, software, content, and collaboration technology-focused environment. However, the effective implementation of such devices requires the development and design of the appropriate technologies, processes, and data systems that encompass both front-end and back-end technologies (Plantin et al., 2018).

Online instruction or online delivery: Online instruction or online delivery refers to an educational process delivered through various multimedia modalities and internet-based platforms. It offers educators and learners the flexibility of asynchronously and synchronously collaboration from various geographical locations. In addition, other terms such as internet-based learning, we-based learning, computer-assisted learning, and e-learning are used interchangeably for online instruction or online delivery (Pike et al., 2022).

Traditional classroom instruction: In-person teaching where instruction is delivered to students in a synchronous environment. For teaching and learning to take place, teachers and students are in the same place at the same time (Khayat et al., 2021).

Professional development: Professional development allows one to effectively uphold their technological proficiency, while ensuring they continuously adapt to meet the evolving standards of their learners (Zhang, 2022).

Summary

The COVID-19 pandemic precipitated a monumental shift in education, necessitating rapid and extensive adjustments at all levels. The conventional classroom setting transformed into remote learning on an unprecedented scale within a remarkably short timeframe. This abrupt transition unearthed numerous challenges forced by instructional technology leaders across many educational institutions. Notably, the digital divide in implementing remote learning across K-12 schools in Mississippi during the pandemic became glaringly evident (Royals, 2020).

This study sought to delve into the lived experiences of instructional technology leaders during the COVID-19 pandemic, with a specific focus on the challenges they encountered, the strategies they employed, and the valuable lessons they learned in the sudden disruption of traditional classroom teaching to remote instruction. The FTRL framework was used to guide this study. The following chapter will provide a thorough exploration of the literature review.

CHAPTER II – LITERATURE REVIEW

Introduction

Chapter two will discuss the historical development and implementation of instructional technology leaders in K-12 education and their roles and responsibilities. The review of the literature will examine challenges faced by instructional technology leaders in their professional practice as it relates to institutional disaster preparedness, insufficient infrastructure, and resources as well as challenges faced during the transition to remote learning during COVID-19. Further, this chapter will illuminate the level of importance of instructional technology in K-12 education and the state of technology future readiness in K-12 education. Finally, the chapter will discuss the conceptual framework that will ground the exploration of the phenomenon under investigation.

History and development of instructional technology in K-12 education

K-12 education evolved from distance education programs to correspondence education schools, and then to the use of online platforms to support instructional delivery. Paper-based correspondence courses were first launched by the University of Nebraska High School in 1929 and later in 1985, students at the university began submitting their classwork via email (Olgren, 1997). In the mid 1980s, the federal government enacted a push for reform in secondary education because of the need to improve educational outcomes with a focus on educational excellence in the United States and improvement in graduation rates. Also, during this time, a report was published called A Nation at Risk: The Imperative of Education Reform. This report illuminated the failing state of schools in America, and it charged educational reform at the local, state, and federal levels. One of the areas of focus for change was in content

areas taught. These included increasing expectations and proficiency in content areas of English, Mathematics, Science, Social Studies, and Computer Science among post-secondary students (National Commission on Excellence in Education, 1983). With this focus on improving computer science education, greater emphasis was placed on educational technology among lawmakers.

Government initiatives toward supporting technology implementation among K-12 educators

Since 1983, United States' federal guidelines have emphasized the important role of technology in supporting education (Culp et al., 2005). In 1988, in a report titled, Power On!, there were several technology tools sighted as natural matches to K-12 education, which included critical thinking support and basic skills instruction (Office of Technology Assessment, 1988). Per this report, properly implementing instructional technology in K-12 education enhances the development of students' writing skills, in addition to allowing students in rural communities the opportunity to use distance learning technology tools to access multiple courses as they are distributed by the school. Additionally, this report revealed that instructional technology tools in K-12 education were flexible educational tools, if supported by adequate, sustained investments and infrastructure, and could extend the depth and scope of teaching and learning.

Furthermore, this report also identified variables that were essential to the development, implementation, maturation, data collection and reporting of instructional technology as supportive tools in K-12 education:

1. Full-time online learning schools and/or programs.
2. Online learning schools and/or programs that offer supplemental courses.

3. Schools that offer blended learning opportunities with multiple options throughout the school districts that are classroom or grade-level specific. (Office of Technology Assessment, 1988)

Although there was a heightened use of technology in K-12 education, it was still a major concern for lawmakers and practitioners, alike. A few of these concerns included its implementation and management, its effectiveness to enhance overall teacher experiences and student outcomes, delivery of instruction to students in rural communities, student understanding of complex data collection, and enlarging the scope of having more diverse resources readily available for teachers and students (Office of Technology Assessment, 1988). A 1992 policy report from the Office of Technology Assessment addressed the need for more efficient administration of achievement tests using technology-based devices. These would enable the use of a multimedia-based portal to archive student assessment records and offer suggestions for student learning improvements (Office of Technology Assessment, 1992). In efforts to help more effectively implement technology in K-12 education, National Education Technology Plans (NETP) began to form. The first NETP was launched in 1996. The United States Department of Education developed a plan named Getting America's Students Ready for the 21st Century: Meeting the Technology Literacy Challenge. This project encompassed four initiatives:

1. Teachers throughout the United States will have the necessary technological support and training required to teach students how to use and navigate computers.

2. All teachers and students in K-12 education, in the United States, will have access to up-to-date computers that include multimedia facets.
3. Every classroom in K-12 education will be connected to the internet.
4. Every school's curriculum in the United States will include online learning tools and software (U.S. Department of Education, 1996).

Each of these initiatives were supported by private sectors, local, state, and federal governments. It was also understood that this project would serve as a framework for all schools and in all classrooms across the United States to develop and implement technology (U.S. Department of Education, 1996).

Though there were collective efforts to implement technology in all classrooms throughout the country, there were a soaring number of teachers who needed support and leadership while doing so. As a result, in 1997, the National Council for Accreditation of Teacher Education (NCATE) Task Force on Technology and Teacher Education was formed. This group included teachers from all over the United States, with diverse backgrounds. The overall goal of this group was to serve as a guide to help teachers buy into the advantages of using technology in their classrooms, help teachers identify deficiencies in education programs as well as provide suggestions to help offset those deficiencies. In addition, recommendations for NCATE included: that improvements for accreditation of education programs should include the use of technology; that technology should be used to illuminate education programs; and to highlight how technology can be used in education programs more effectively.

As a result of the progress that had been made since 1996 regarding technology implementation in K-12 education, in the year of 2000, the 1996 NETP was revised and

renamed e-Learning: Putting a World-Class Education at the Fingertips of All Children. The updated 2000 NETP included:

1. All teachers and students will have access to technology in each classroom, in all schools, and in their communities and in their homes.
2. All teachers or instructors will effectively use technology to assist students with achieving high academic standards.
3. All students will have information and technology literacy skills.
4. Teaching and learning applications for use in the next generation will be improved by research and evaluation.
5. Teaching and learning will be transformed by networked applications and digital content (U.S. Department of Education, 2000).

In 2001, the No Child Left Behind Act (NCLB) and the Elementary and Secondary Education Act (ESEA) (2001) included technology as an important tool to support teaching and student learning in education as well as the recommendation that all students should be technological literate by the eighth grade. The No Child Left Behind Act was signed into law by President George W. Bush in 2002 and included four initiatives to ensure and undergird the advancement of class instruction and student learning in K-12 education. Those four initiatives were:

1. Each school would be held accountable to report improvements student learning.
2. Advanced flexibility to help schools reach their goals.
3. Provided additional options for parents or guardians to choose alternate schools for their children instead of low-performing schools.

4. Research would be used as a tool to determine best practices for increased student learning (U.S. Department of Education, 2004).

K-12 schools across the United States improved technological abilities and readiness by using technology to assist with student learning of core content and students' developmental skills in areas such as research, critical thinking, and communication (Culp et al., 2005). The belief was that with the proper implementation and use of instructional technology tools in education, technology would support teaching and student learning and would lead to overall educational success, in addition to preparing both teachers and students for significant and increased cultural and societal changes related to technology (Mutekwe, 2012). The No Child Left Behind Act had accelerated the trend of using online delivery for teaching and learning, which was deemed as a compliment to the traditional classroom setting. Teachers and students had begun to use technology as the primary tool to access information, students were exposed to various perspectives with help of technology in their schools, and technology was also used to help integrate interactive software, simulations, and multimedia enhance overall teaching experience and learning outcomes (U.S. Department of Education, 2004). In 2004, with an even greater focus on technology use in the classroom, the NETP was again revised and renamed, Toward A New Golden Age in American Education—How the Internet, the Law and Today's Students Are Revolutionizing Expectations. The updated 2004 NETP addressed seven key actions and recommendations for preparing children now for future technology readiness. These actions and recommendations are summarized from U.S. Department of Education (2004) as follows:

1. Leadership among all levels in K-12 education should encourage systematic change by providing transformative leadership that fosters creativity.
2. Consider re-evaluating and re-allocating current budgets and educational objectives for needed technology.
3. Technology training for teachers should include innovations and examples that offset barriers to learning best practices of technology and access to research in technology.
4. Continue to support virtual schools and e-learning opportunities.
5. Support high-capacity, high-speed broadband communications access on a continuous basis to help both teachers and students see the full potential of technology while at school and at home.
6. Transition from relying solely upon textbooks to using more online content or multimedia, which will in-turn offer more advantages such as enhanced teaching and learning experiences for teachers and students, improved accessibility, increased flexibility, heightened efficiency, and more cost effective for schools and school districts.
7. Implementing data systems will help manage online assessments that measure student performance, which will ultimately empower teachers.

Government initiatives toward using technology to achieve K-12 educational goals

According to Westera (2004), implementing technology into education soared beyond most expectations. In short, some of those expectations included improved performances by students, teachers, extended faculty, and staff; reduced cost of textbooks and workbooks; extended services beyond the classrooms; and more novel research

opportunities. Increased connectedness and access to information afforded by technology created another shift in the education model which was adjusting to societal demands. A successful shift in the education model was dependent upon how well technology was implemented and used. New technology tools or new technology software or equipment were often referred to as technology innovations. Change agents in K-12 education integrated technology innovations in their classrooms, schools, and school districts (Ensminger & Surry, 2008).

In 2010, the United States Congress challenged the United States Department of Education to increase the percentage of college graduates from forty-one percent to at least sixty percent within the next ten years. Though this was an aggressive challenge, with proper and continuous implementation of innovative technology tools in education and on-going monitoring and evaluation; plus, proper alignment of investments, policies and actions, the challenge could be accomplished (U.S. Department of Education, 2010). In efforts to meet the challenges given by the United States Congress, the 2004 NETP was revised and updated to the 2010 NETP, Transforming American Education: Learning Powered by Technology. This plan was centered around the implementation and use of technology for all learners. Actions and recommendations outlined in the 2010 NETP (U.S. Department of Education, 2010) are summarized as follows:

1. Learning: This plan leveraged the power of technology to promote individualized learning and enabled on-going learning for all students, which produced student engagement and student empowerment.
2. Assessment: This plan placed a heightened emphasis on the use of technology to properly measure assessments. Data derived from the assessments were

used to guide decision-makers and stakeholders, regarding what was best for all learners.

3. Teaching: Illuminating, elevating, and strengthening the capacity of the teaching profession was as important as leveraging technology. In this plan, more of an emphasis was placed upon creating connected teachers to replace solo teachers, and ensuring all teachers are provided with analytic technology tools and access to data, always.
4. Infrastructure: This plan included a robust approach for infrastructure that would provide all teachers and students with the technology tools they needed and where they needed them. Included in those technology tools were administrative tools, management systems, educational software, webservers, and internet connectivity.
5. Productivity: Redesigned educational practices by leveraging technology that promoted being fiscally responsible for every dollar, which ultimately helped to provide a performance view from a financial perspective.

With this revision, the field of Instructional Technology in education also faced a lack of an identity and the inability to inhabit a definition for itself due to fast-paced, technological advancements. In 2016, revisions were made to the 2010 NETP which became known as, Future Ready Learning: Reimagining the role of technology in education. Among the initiatives was a call for using technology to empower and engage learning in informal and in formal settings that encourages learners to be creative, active, knowledgeable, and ethically prepared for an internet-infused society. The belief was that through building non-cognitive competencies, technology could enable individualized

learning and experiences that are more relevant and fuel academic achievement. Particularly, technology would be the driver for bridging the gap of the digital divide among learners in rural communities as well as reducing disparities in access to technology among minority groups in K-12, for example Black girls. Also, during this time, Massive Open Online Courses (MOOC) were introduced and used to deliver technology-based instruction outside of the traditional classroom setting. These were used to support project-based learning to develop specific skills within specific disciplines. Enhanced use of simulations and games in education. This increased collaboration among students within classrooms and increased problem-solving skills and analytic skills among students.

> The most recent NETP update was renamed Reimagining the role of technology in education: 2017 national education technology plan update. This update, published in 2017, was highlighted an overwhelming amount of progress and effectiveness in technology implementation within one year. The update expanded efforts towards the alignment, design, and piloting of mobile technology (U.S. Department of Education, 2017).

Government initiatives toward reducing barriers to technology integration in K-12 classrooms

According to Tondeur et al. (2017), the process of utilizing technology to help support twenty-first century teaching and learning is called technology integration. In efforts to omit barriers to technology in education, the U.S. Department of Education and Office of Educational Technology, applied federal mandates that would increase the integration of technology in education. The National Assessment of Educational Progress

(NAEP) is a sub-set of the National Center for Education Statistics (NCES). NAEP used Technology and Engineering Literacy (TEL) assessments to measure the levels of how students were able to apply engineering and technology to situations that resembled real-life. TEL used interactive technology that was scenario-specific to monitor student's knowledge, abilities, and skills. In 2018, the TEL assessments were administered to at least 15,000 students in the eighth grade. In comparison to data derived from NAEP in 2014, in 2018 the eighth-grade students achieved scores that were two points higher than in 2014. The three content areas that were assessed were Information and Communication Technology, Design and Systems, and Technology and Society. The expectation of each student was to demonstrate their ability to reason and use critical thinking skills in the following three areas: Collaborating and Communicating, Achieving Goals and Developing Solutions, and Understanding Technology Principles (National Center for Education Statistics, 2019).

Further, the National Center for Education Statistics (2020) published data that included measured levels of how efficiently school districts and teachers collaborated to reduce limited access to technology for students, and measured levels of how effectively teachers understood and implemented technology tools in their classrooms. These data were collected from grades three-twelve. At least one of the following core subject areas was used: math, science, social studies, or social science, English or language arts. These data sets included 2,900 teachers from 1,600 schools. Chromebooks, desktops, laptops, and tablets with virtual and physical keyboards were among the instructional technology tools that were used during testing.

Various modes toward technology integration to promote student learning

The growing push for technology reform in K-12 education led to its use as a resource to support instructional delivery and student learning. This came in the form of technology used globally and used in classrooms in different modalities, which include online, supplemental, and blended learning environments.

Global use of technology in classrooms

Prior to the onset of COVID-19 pandemic in Spring 2020, globally, K-12 education had options for distance education environments (Christensen et al., 2011). Various countries throughout the world were using distance education applications for appropriate education levels (Fis, 2021). In the United States, students had online learning options from at least 80% of the schools and school districts (Watson et al., 2013). In China, at least 160 million students in K-12 education had options to receive free online training or online education, including students in rural China (Wu, 2014). Learning management systems, school portals, online technology tools and resources were technology tools that were being used by educators in Australia (Harris, 2008). New Zealand had established the use of video conferencing and virtual learning networks in K-12 education (Barbour et al., 2011).

In K-12 education, traditional classroom settings were accompanied by distance education resources, as well as investing in technology tools to support educational outcomes for students in Singapore (Powell & Patrick, 2006). In Hong Kong, communities for learning were developed, as well as online education resources for educators to assist in online education expansion (Wong & Li, 2006). Investments in technology resources and technology infrastructure to support K-12 education for

teachers, students, families, and communities have been made available and at the forefront in Taiwan (Kong et al., 2014). These indicate distance learning in K-12 education had been integrated globally prior to the onset of COVID-19, using technologies such as videoconferencing, digital devices such as cellular phones and tablets, DVDs, educational radio and video, email, online training, and online school campuses. The integration of technology to support distance education in K-12 classrooms in the United States can be discussed through its development in online, supplemental, and blended instructional modalities.

Online instructional delivery. In the early 2000s, programs began to launch online programs to help offset educational barriers for students such as the need to restore credits to permit or grant graduation and/or from an administrative perspective, the need for the school to expand or enhance current educational programs (Watson, 2013). Full-time online learning schools were often referred to as cyber-schools. Students enrolled in cyber-schools, were mostly students that were primarily enrolled in an online learning school. In these schools, state assessments were required to measure school performance and student outcomes. Students enrolled in full-time cyber-schools could earn diplomas by attaining credit hours upon successfully completing their courses. These schools were often used by students across the state, and across multiple school districts. Depending upon the requirements of each state's department of education, some full-time cyber-schools or programs were allowed to enroll students from out-of-district (Harris, 2020).

In 1996, Florida Virtual School (FLVS), located in Orange County, Florida, launched its first online program. In the school year of 2003-2004, FLVS was added to the Florida Education Finance Program as a statewide online school. FLVS is recognized

in all school districts throughout the state of Florida; while course enrollments reached beyond 400,000 (Florida Virtual School, 2013). In 2002, the Dakota Interactive Academic Link (DIAL) began offering online learning classes for students in middle school and for students in high school, grades 6th-12th. These online courses were available for students who resided in South Dakota. And each course was accompanied with an administrative fee. Remedial coursework, credit classes, credit recovery classes, and a career and technical education (CTE) program were among the list of available online courses that were offered to the students (Watson, 2013).

Supplemental online instructional delivery. Supplemental online courses were typically used for students who are enrolled in an online program, in addition to being enrolled in a separate school. Supplemental online courses are offered in small numbers and are often referred to as part-time courses. In 1994, Utah Electronic High School, was one of the first schools to offer supplemental online courses to their students. Other neighboring states began to offer supplemental online courses. In the year of 2000, the Michigan Legislature fully funded Michigan Virtual School. Michigan Virtual School was operated by Michigan Virtual University. At the start of school year 2009-2010, thirty-one states had at least one virtual school operating in their state. By the start of school year 2012-2013, some state virtual schools had closed, but over twenty-seven supplemental online courses or programs had served over 740,000 students (Watson, 2013).

Blended learning instructional delivery. Blended learning is the change agent that transitioned face-to-face teaching and learning to providing both teachers and students with flexibility and individualization by way of online learning, in addition to the

traditional classroom setting. Blended learning is often recognized as fully blended schools. Blended learning encompasses self-paced learning for students, student-centered educational paths, places, and time that may also be offered in a physical building other than their home. Additionally, blended learning offers individualized, technological learning experiences to each student (Watson, 2013). Technology-enabled learning such as blended learning was used to help teachers integrate appropriate technology tools inside their classrooms, and outside of their classrooms. Some learning technology tools were implemented to help learners connect and translate abstract concepts in tangibles ways. Some examples were three-dimensional and augmented reality software (U.S. Department of Education, 2016). With these learning technologies, their effectiveness on learning was dependent on teachers' knowledge, skill, and ability in implementing technology appropriately in instruction to achieve student learning outcomes. This introduced the need for support from those with technology expertise and leadership to guide the process of effectively integrating technology in the classroom.

Instructional technology leadership in K-12

Instructional technology leadership is essential when implementing technology across disciplines in K-12 education. With the evolution of instructional technology in education and in other professions, came an increasing need for specialists who were trained specifically for developing, designing, implementing, assessing, and measuring instruction. These specialists would be responsible for comparing, researching, and selecting the appropriate technology tools to support online and traditional programs. Hung et al. (2017) advised that the adoption of technology can be made successful by using effective, efficient, and proper leadership, and will foster the potential of enhanced

teaching and learning. According to Simsek (2005), the roles of instructional technologists in education changed significantly since its inception over one hundred years ago, and it would not be practical, satisfactory, or proper to restrict a general definition, given the uniqueness and style of this area.

Roles and responsibilities of instructional technologists

The roles and responsibilities of instructional technologists have varied, as they have been based upon the needs of the employers and the technology tools that were being used (Corbeil, 2013). K-12 instructional technology leaders' titles may include innovation specialists, e-learning specialists, technology coaches, integrating specialists, technology coordinators, and instructional technologists (Sugar & van Tryon, 2014; Sugar, 2009; Stanhope & Corn, 2014; Peterson, 2015). Their responsibilities may range from having dual roles as administrators, academic coaches, or teachers, to focusing solely on the implementation of technology throughout the school and or school district (McLeod, Richardson, & Sauers, 2015; Richardson & McLeod, 2011; Yu & Prince, 2016). In K-12 education, it is also the responsibility of instructional technology leaders to design, develop, and implement professional development to teachers and staff. In many cases, instructional technology leaders are categorized as innovation specialists, integration specialists, technology coaches, or technology coordinators (Karlin et al., 2018).

Role of professional development in instructional technology leadership

Successfully implementing technology into all levels of education requires instructional technology leadership as a means of support. In most instances, technology leadership is delivered to educators through professional development. Instructional

technology leadership also adds accountability for both teachers and students, which in most cases, aids in increased educational outcomes (Kara & Cagiltay, 2017).

In efforts to increase technology implementation in education, the role of instructional technology leaders is enhanced by providing teachers with additional technology support that would foster or undergird their understanding of pedagogical beliefs that are foundational for technology implementation, which also aids in producing increased educational outcomes. Instructional technology leaders are tasked with accountability measures when implementing innovative technology not only in times of crisis, but throughout times of relatively normal school years (Malkus et al., 2020).

Technology leadership is vital in implementing technology in education while seeking to obtain the effective and sustainable promise of technology. Professional development is as equally important in obtaining the promise of technology as it is aids in cultivating a rich, technology-inspired environment across school districts. Professional development in instructional technology also helps to address policy changes or changes to procedures that are contingent upon the successful implementation and utilization of technology in education (Low et al., 2017).

According to a research study conducted by Mitchem et al. (2003), using intense professional development for instructional technology, participants in K-12 education implemented significantly more instructional technology methods in their teaching practices than before, which also led to increased teacher and student engagement. Additional findings include students' post-test scores were significantly higher than their pre-test scores, after receiving instruction delivered with new and innovative instructional technology methods that were derived from a series of intense professional development.

These results in this study were conducive with the overall goals in professional development in instructional technology, which includes providing instructional technology leaders, or participants, with pedagogical knowledge and technology skills and training to meaningfully implement technology methods into their instructional practices while seeking to increase student engagement.

In an exploratory study conducted by McLeod et al. (2015), school district superintendents were interviewed to gather information regarding district-level technology implementation methods and mind-sets. Professional development in instructional technology leadership was sighted as an important variable by the participants when integrating technology in their school districts. In addition, the findings of this study concluded that adequate professional development is an integral component in implementing technology initiatives and professional development is at the forefront of instructional technology leadership in K-12 education. This study also noted that common themes such as the need for professional development in instructional technology and technology reform were expressed by the participants.

Disruption in K-12 education during COVID-19

Despite that the implementation in technology has been a focus of reform in education in the United States, the onset of COVID-19 pandemic revealed a lack of preparedness in using technology to support the achievement of educational outcomes. The pandemic led to a rapid disruption in education across the globe and at all educational levels. According to Hartshorne et al. (2020), many countries originally anticipated brief, temporary school closures amid the COVID-19 pandemic, however the emergency school closures were enforced during the spring semester of 2020 in most

countries and did not re-open until Summer and Fall of 2020, by way of remote learning. At least 1.6 billion students did not have access to education and at least 100 million were adversely affected because of the pandemic (Benalcázar et al., 2021). This abrupt educational shift prompted the need for sustainable asynchronous technology in both K-12 education and in post-secondary education throughout various countries in the world.

According to Benalcázar et al. (2021), some post-secondary education programs, such as computer sciences and social sciences, were somewhat more prepared to continue their education through 100% remote learning environments. On the other hand, post-secondary education programs such as engineering and medical programs were negatively affected by the pandemic due to the inability to receive hands-on, practical learning experiences. Additionally, the impact of the pandemic highlighted the wide gap in equity and access to technology resources necessary for supporting teaching and learning outcomes. Specifically, a disparity in equity and access was seen among school districts serving student populations from rural and low socioeconomic regions (Francom et al., 2021).

Transition from traditional classroom learning to remote learning

Globally, as schools faced the pandemic, there was an abrupt shift to teaching remotely with a large emphasis on distance learning using different types of remote learning models and structures. School districts and schools had to quickly develop a plan to make decisions about when and how to resume teaching and learning beyond the traditional classroom environment while ensuring the health and safety of students and their families (Dibner et al., 2020; Francom et al., 2021). This was a critical piece as institutions needed an emergency management plan and strategies to minimize the

disruption in supporting academic functions so that students would not fall behind during a time where instruction could only occur in distance learning formats.

According to Hodges et al. (2020), while distance learning has been introduced in education since the 20th century, many schools were not technology prepared to sustain 100% distance learning education at the onset of the COVID-19 pandemic. Although distance learning, which includes remote learning, in past years has been accompanied with a stigma of providing low quality educational outcomes, research has revealed evidence of its effectiveness when developed and implemented using sound design solutions (Hodges et al., 2020). Due to this, Hodges et al. (2020) suggested that the term "emergency remote teaching" should be used to distinguish the implementation of remote or distance teaching and learning because of the coronavirus pandemic due to unique challenges faced with the rapid shift in learning environments. According to Francom et al. (2021), there's a need for research examining teachers' transition during this unique time of a state of emergency.

Further, because of world-wide mandates that prevented face-to-face classroom instruction due to the COVID-19 pandemic, many public-school districts had to develop and implement disaster preparedness plans to guide the transition of teaching and learning in remote environments. Coupled with the rapid emergence of educational technology solutions, practitioners and instructional technologists have noted that the likelihood of teachers and students experiencing cumbersome levels of stress during the wake of this disaster was amplified (Hodges et al., 2020). The increased pressure to train teachers and students in using technology for teaching and learning, respectively, also

accounted for heightened levels of stress experienced by instructional technology leaders, teachers, and students.

Oliveira et al. (2021) conducted a qualitative study using semi-structured interviews with 20 students and 10 teachers to explore the increased pressure faced by each group due to the COVID-19 pandemic. The authors noted that many teachers and students were pressured into unstructured, fast-paced, emergency remote teaching and learning modes of technology to continue the process of teaching and learning in K-12 education and in post-secondary education. The findings of the study revealed three major themes associated with "educational process, ICT usage, and personal adaptation" (Oliveira, 2021, p. 1364). Positive outcomes included increased engagement between teachers and students outside of the classroom, new opportunities to develop and learn various levels of instructional technology, and the production of content development was at an all-time high. This study also revealed there were barriers to achieving overall teaching and learning educational outcomes, a lack of teacher training in instructional technology, and reluctance by participants in adapting and adopting new technologies. Additionally, negative outcomes were reported related to personal challenges experienced which included lack of motivation, cumbersome workloads, lack of productivity, and in some cases a decline in overall mental health due to experiencing increased stress.

According to Adedoyin and Soykan (2020), teachers and students both experienced a lack of sustainable design and development when implementing technology in an emergency remote online learning environment such as COVID-19. At the onset of emergency remote learning during COVID-19, the workload for instructional technologists and instructional technology leaders became cumbersome with the need to

develop and implement technology-based platforms for teaching and learning, integrate new and existing internal and external technology applications, and assisting educators with transferring their course content to remote learning platforms while navigating compatibility issues. Ribeiro (2020) added that the abrupt shift from traditional classroom teaching and learning to emergency remote online teaching and learning was accompanied by logistical issues as well as a shift in attitudes towards teaching and learning by administrators, teachers, and students. In efforts to offset negative impacts in emergency remote teaching and learning caused by COVID-19, many schools, school districts, and post-secondary institutions sought assistance from alumni and educational private and public organizations to assist with socio-economic interventions by way of food, medical and psychological and medical assistance for residents, students, and commitments from internet service providers to provide educators and students with free internet (Fishbane & Tomer, 2020). In addition to the structural and personal disruptions in teaching and learning continuity faced by teachers and students, access to necessary technology to support learning was also an issue at large.

The digital divide: Issues of equity and access to technology in K-12

According to Pittman et al. (2021), the digital divide is defined by the lack of intersectionality of culturally responsive teaching, global learning communities, and new technologies to which would collectively increase new experiences for individuals and give individuals more opportunities to build more knowledge. In other words, it is the gap in accessibility to computer devices and the internet among two groups where there is a disparity in educational attainment and income. Due to the emergence of COVID-19, technology divides in online learning were revealed with nearly 830 million students

world-wide not having access to computers and 330 million people did not have access to internet at home.

Barriers to remote learning are particularly common in low-socioeconomic countries (UNESCO, 2020). In areas where access to technology or reliable infrastructure were not considered barriers, teachers reported that they were not trained to facilitate online learning to their students (UNESCO, 2020). At the onset of COVID-19, 95% of North Americans had access to internet, 87.7% of Europeans had access to internet, compared to only 39.6% of Africans having access to internet. Even in the areas where access to internet was more prominent, there were further digital disparities that existed such as internet speed, data price, and bandwidth distribution which are ultimately shaped by socioeconomic variables such as household and neighborhood income, educational background, employment, age, and gender (Bozkurt et al., 2020).

According to UNESCO (2021), in 2021, globally, there were over 1.5 billion students in both K-12 education and in post-secondary education that had been affected by school closures due to COVID-19. The digital divide was highlighted throughout the world as inequalities in household connectivity and dependable infrastructure soared in numbers and became a global threat to learning continuity as the world experienced an unprecedented disruption in education. In efforts to bridge the digital divide, UNESCO and its partners formed the Global Educational Coalition. The purpose of the Global Educational Coalition was to protect the right of education for all learners during COVID-19 and beyond. This coalition comprised of a 175-member panel consisting of those from academia, civil societies, the United Nations family, and private sectors who collectively exchanged and collaborated to protect those rights. While the coalition

focused on three major concerns related to connectivity, gender and teachers, and educational recovery, panel members also for advocated protecting the security, privacy, and personal information of all learners (UNESCO, 2021).

In the efforts to help offset the digital divide, increasing technology connectivity in homes, public and private business sectors, and in education would require proper development and design of technology strategies for global teaching and learning opportunities for everyone (Pittman et al., 2021). Harris (2019) urged that teachers and students living in low socioeconomic areas with diversity and poverty at an all-time high, should not have limitations to access to technology and should not have expensive, subpar, or inefficient technology. According to Ali et al. (2021), at least one-third of students in K-12 education in the United States were affected by the digital divide at the onset of COVID-19, which ultimately contributes to significant and increased levels of inequitable loss of learning. The onset of COVID-19 in the United States highlighted the barriers of technological inequities that already existed prior to the pandemic. This heightened the need to focus on bridging the digital divide in technology access in education to ensure that students across the world and in the United States have access to workforce related resources which will strengthen the economy (Ali et al., 2021).

According to Ali et al. (2021), approximately 15 million to 16 million American students and 400,000 teachers in the K-12 education sector were affected by the digital divide in the United States. Of those affected, 40% to 50% of the students were from rural regions in southern states that included: Oklahoma, Arkansas, Alabama, and Mississippi. In these rural regions where students were technology-disconnected, 55% were of Native American, Latino, and Black or African American decent, while also

representing 40% of the overall student population. Additionally, 50% of the students affected by the digital divide were from low socioeconomic families who earned less than $50,000 per year. The technology-dysconnectivity of teachers illuminated teaching and learning limitations.

In their quantitative study Ali et al. (2021) concluded from their findings that in addition to the need for teachers to be connected to technologies, for teachers to successfully design and develop high-quality remote learning experiences for their students, they needed more professional development, instructional technology coaching, and mentoring. This quantitative study also revealed there were three main causes of the digital divide in the urban and suburban communities, and rural southern states: availability, affordability, and adoption. In K-12 education, 60% (approximately 9 million) of students who were technology-disconnected were African American or Black and urban and were not able to afford technology access. In addition, 25% (approximately 4 million) does not have access to reliable or available technology or broadband internet services. This barrier unreasonably affects students that are in rural areas and are Native American. Finally, the remaining 40% (approximately 6 million) of students that are technology-disconnected are affected by adoption barriers that include: language barriers or insufficient digital literacy.

Nearly six months into the pandemic, much more had been learned regarding the largest, most unanticipated educational interruption in history of the United States due to COVID-19 pandemic. Chandra et al. (2020) reports various case studies that were conducted at the city, state, and school district levels across the United States that

concluded there are three processes that would assist in closing the digital divide. The three processes are:

1. Assess: Assess learners who need access to technology or connectivity, technological devices, and where the learners are located or where the learners live.
2. Determine: Determine which connectivity options and devices are available and desirable, and distribution methods for all.
3. Find: Find the resources and or money needed to pay for the connectivity, devices, and distribution methods.

There were few states and school districts that were able to rapidly pivot to school closures because they had a history of connectivity investments. Limited infrastructures, supply chains, and insufficient funding are all barriers to bridging the digital divide, even in school districts, cities, and states with high-quality needs assessments (Chandra et al., 2020). Bridging the gap to eliminating the digital divide among all students in the United States is essential as it enables the reduction of inequities and advances economic growth which will ultimately increase or advance societies altogether. Fifty-nine groups that included educators, school counselors, librarians, and students petitioned for the United States Congress to commit $12 billion to assist in closing the digital divide. In addition, Chief Executive Officers of major companies such as Salesforce, AT&T, Land O'Lakes, and Microsoft all issued either oral or written statements of their support of bridging the gap to the digital divide (Ali et al., 2021).

During the wake of the COVID-19 pandemic, the digital divide in Mississippi was highlighted as an emergency need to bridge the technology gap to provide quality

technology to all teachers and students as they were abruptly shifted to remote teaching and learning from home. At least 55% of public schools in Mississippi are in rural areas and have experienced technology connectivity issues due to the digital divide (Royals, 2020).

According to Nicosia (2021), due to the COVID-19 pandemic, many Mississippi schools and school districts have been among many within the United States to receive both federal and state funding to help bridge the digital divide. School districts such as Warren County School District, Columbus and Aberdeen Municipal School District were among the rural Mississippi school districts to receive CARES Act funding from the federal government to provide students and teachers with digital upgrades that led to enormous gains in digital transformations. Some digital upgrades included: providing hotspots to teachers and students who were technology disconnected as they lived in rural areas along the Mississippi River, providing students with mobile devices or Chromebooks who did not have one prior to the pandemic, and private companies such as AT&T providing internet subsidies for low-income families that were in their service area. According to Wright (2022), while Mississippi has received financial support for infrastructure and mobile devices to assist with bridging the digital divide, in 2021 the Mississippi Department of Education also responded to the digital divide by hiring and training Instructional Technology Coaches throughout twenty-nine school districts in Mississippi. Majority of the Instructional Technology Coaches were assigned to the most rural school districts in the Mississippi Delta. In more efforts to bridge the digital divide in Mississippi, the Mississippi Department of Education has also initiated digital supplemental subscription for all subjects, which will be guided by Instructional

Technology Coaches or teachers that have received appropriate instructional technology training (Wright, 2022).

The placement of increased infrastructure in rural Mississippi counties should continue to be a priority for Mississippi lawmakers to help bridge the digital divide. This requires concerted strategic efforts among K-12 leaders at the school districts and school administrative levels who work with instructional technology leaders to implement technology infrastructures that address the teaching and learning challenges faced due to the digital divide (Royals, 2020).

In essence, the findings from Ali et al.'s (2021) study suggests that to permanently bridge the gap to the digital divide, local, state, and federal lawmakers should develop and finance long-term solutions. Local and state level concerns should include the design and development of state broadband strategies, lower deployment costs, procurement support, investment in outreach, and instructional technology leadership to provide and support professional instruction for educators which will ultimately promote instructional training and digital literacy and ensure needs assessments for the digital divide are recorded and reported accurately (Ali et al., 2021). Permanently bridging the gap to the digital divide promotes resilience learning systems that are future-proof, contributes to eliminating the poverty cycle, and is an overall fundamental matter of equity.

Challenges of professional practice that instructional technology leaders faced during the COVID-19 pandemic

At the onset of COVID-19, there was an immediate need for schools and school districts world-wide to develop and implement initiatives that supported online teaching

and learning through both asynchronous and synchronous modalities. This then applied immediate pressure on schools and school districts to provide professional development opportunities as well as make immediate adjustments to accountability measures to manage the crisis impact (Malkus et al., 2020).

A quantitative study conducted by Webb et al. (2021) found that K-12 educators continued to rely on professional development in instructional technology for preparatory knowledge, skills, and understanding for their upcoming school year. Additionally, the findings of this study also noted that only 24% of the teachers had received training or had taken additional courses to refine their knowledge of implementing technology in the classroom. These participants displayed adaptability and resilience in their self-efficacy during their continued use of technology during COVID-19. The remaining 76% of teachers desired continued professional development in instructional technology to assist them during the transition of remote or online learning during COVID-19. The results of this study implicated the need for and importance of continued professional development in instructional technology for teachers in K-12 education to support good teaching.

In addition, a study conducted by Hartshorne et al. (2020) concluded that when professional development in instructional technology supports the Academic Communities of Engagement (ACE) framework, this provided cognitive and behavioral support for students, teachers, counselors, administrators, and parents when using distance or remote teaching and learning. The findings of this study supported the continued use of professional development in instructional technology to undergird future teaching and learning practices, supporting collaborative approaches between instructional technology leaders and teachers when using digital tools.

Furthermore, a quantitative study conducted by Clausen et al. (2020) revealed that 59% of students in 7th-12th grade were unable to be contacted by their teachers at the onset of COVID-19 pandemic. The school administration also made phone call and email attempts to reach students and their parents but were unsuccessful. There were also many instances where students, parents, or guardians were unaware of assignments and homework or their due dates; all of which demonstrated the need for more professional development in instructional technology to assist with collaboration methods between students, teachers, parents, or guardians (Clausen et al., 2020). As a result of these findings, the authors concluded that researchers and practitioners can rely on previous research studies that support the importance of, the continued use of, and need for more professional development instructional technology to improve collaboration between teachers and parents.

According to Waterford UPSTART (2018), professional development in instructional technology helps to support teachers in developing, designing, and delivering course content which will increase the opportunities for more communication between students, teachers, and families. Planning for future professional development in instructional technology will prioritize comprehensive communication strategies between families and schools and create opportunities for community engagement using digital technologies such as text, email, classroom websites, communication apps and social media (Mete & Eunbae, 2018; Waterford UPSTART, 2018).

Restructuring curriculum design through leveraging technology infrastructure. During the COVID-19 pandemic, instructional technology leaders faced various challenges as they led their institutions during the abrupt transition of educational

practices to remote learning. These challenges were concerned with curriculum design, ensuring equity in access to technology tools, acquiring funds to support technology implementation efforts, supporting engagement among educational stakeholders, ensuring academic integrity data security, and privacy, supporting personalized professional learning of teachers. According to Babbar and Gupta (2021), school districts should implement a fundamental platform for systematic change. This includes staying abreast of constant updates on emerging trends in educational technology, supporting and preparing students for a remote or online workforce, implementing digital curriculum designs, ensuring digital equity practices, and implementing and managing hybrid instructional learning modules; all of which will enable the capabilities to leverage technology infrastructure (Babbar & Gupta, 2021; Shamir-Inbal & Blau, 2021).

Ensuring equitable access to digital technology. Equitable access has been an issue in K-12 education long before the onset of COVID-19 (Liu, 2021). Primarily, having access to digital devices and having home internet have been longtime issues in K-12 education (Liu, 2021; NCES, 2021). In 2019, prior to the onset of COVID-19, it was reported that 86.6% of individuals in developed economies were using technology such as the internet, while in low-income economies only 14.9% of individuals were using the internet via broadband. Additionally, only 9.5% of those individuals in low-income economies had access to a digital device at home (International Telecommunication Union, 2020). Inadequate digital connectivity was already compounded by the lack of sufficient educational and home resources, and family support prior to the COVID-19 pandemic. According to a mix-methods research study conducted by Wharton-Beck et al. (2022), 74.5% of the instructional technology leaders,

district-wide, reported that they received sufficient technology to disseminate to the staff at their schools at the onset of COVID-19 and 59.6% agreed that students received adequate technology. Meanwhile, 28.7% of instructional technology leaders felt as though students did not receive adequate technologies from the school districts.

Securing funding to acquire technology resources. Securing funding for technology resources in K-12 education is not a new issue. Digital disparities, especially in rural areas throughout the world, existed prior to the onset of COVID-19, largely due to the lack of funding that was required to bridge the gap (Liu, 2021). At the onset of the pandemic, the overall goal for the world was to mitigate such connectivity challenges by providing educational resources to support all students, teachers, and families, which would in-turn support the continuity of education throughout the world (UNESCO, 2020). As a result of the rapid transition from face-to-face teaching and learning environments, all educators had to resolve to emergency remote teaching with technology, with the lack of adequate technology being one of the most critical variables to implementing distance education (Bozkurt & Sharma, 2020; Rapanta et al., 2020; Thompson & Copeland, 2021).

Notated in a report by DLC (2019), the Unites States, all K-12 public schools are funded wholly by each state's legislatives via state tax appropriations, state grants and or course fees. According to the U.S. Department of Education, (2022), the American Rescue Plan Act was signed into law by President Joseph R. Biden on March 11, 2021. The overarching intent for the American Rescue Plan Act was to provide critical monetary relief to all states (including the District of Columbia and Puerto Rico), school districts, schools, teachers, students, and their families in efforts to recover from the

COVID-19 pandemic. A total of $125 billion was allocated to the American Rescue Plan Act to aid in safely reopening schools and to recall missed educational opportunities for students to catch up.

Wright (2022) reported that $2.2 billion from the American Rescue Act Plan had been allocated to the state of Mississippi to assist with safely educating all students, while accelerating teaching and learning for all students. The funds were intended to be distributed to schools and school districts with low-socioeconomic populations first. This funding was intended to bridge the digital divide in Mississippi by ensuring all teachers and students have mobile devices for teaching and learning, adequate infrastructure and broadband access for all teachers and students, in addition to providing low-cost or free internet services to families in low-income and or low socioeconomic communities (Royals, 2021).

Engaging students and parents in learning. According to Francom et al., (2021), in times such as the COVID-19 pandemic, it is essential for technology leadership staff to openly adopt and embrace a good attitude towards new online resources and new technology tools. Students and parents alike will be encouraged by the positive attitudes displayed by technology leadership and by teachers. According to Tull et al., (2017), the ongoing encouragement of positivity of technology use could result in establishing long-term enhanced communication and collaboration between teachers, students and parents, and instructional technology leaders. The combined use of distance learning and social media could support teaching and learning by stimulating the art of engagement and resilience from students and parents in times of crisis.

According to a quantitative study conducted by Kraft et al., (2020), approximately 7,800 teachers were surveyed regarding their perceptions during the emergency transition to remote teaching and learning at the onset of COVID-19. Student and parent engagement or communication was included in the survey. The survey concluded that teachers with reliable communication from technology leadership staff, coupled with key professional development strategies, assisted teachers with sustaining a sense of success.

In their case study, Borup et al., (2020) found the use of the ACE framework to be useful for encouraging community support to aid student and parent engagement. This framework consists of two different communities to better meet the needs to encourage student and parent engagement: students' personal community of relationships (friends, siblings, parents, and extended family) and the course community associated with school (counselors, administrators, peers, teachers).

A community-based theory was also added by Ferreira (2020) suggesting that communication supporting community resilience, would support and encourage partnerships between school and home environments to stimulate resilience during a crisis. Additionally, Darling-Hammond et al. (2020) reported that during the pandemic there were many teachers who had experienced challenges with delivering online instruction to their students and parents and added that it is necessary to implement technology-based policies within schools and school districts to support accountability and technology access for communication. It is also imperative that technology leaders are prepared to develop and implement accountability measures for all students that include equitable, socially responsible, and successful practices.

Academic integrity, data and privacy concerns. A recent study conducted by Khalil et al. (2018) revealed an issue concerning user-consent agreements for gaining access to online learning platforms referred to as Massive Open Online Courses (MOOC). Upon giving consent, users' data were being captured. Furthermore, Kerres (2020), urges the need for a level of heightened security and safety measures added to virtual calls as marketing companies are targeting online environments to capture data. With the onset of COVID-19, many education institutions have experienced a surge of virtual call usage for meetings with peers, students, families, school administration and for professional development (Manskar, 2020). Additionally, with the increased level of online learning management systems use, user data are being captured and sold to third parties, in addition to being analyzed for further marketing use (Prinsloo et al., 2019).

In efforts to preserve academic integrity, online proctoring services have been used to monitor students while taking assessments. Bozkurt et al. (2020) emphasized the importance of preserving academic integrity, and data and privacy concerns during the swift, global transition from face-to-face teaching and learning to online or remote learning. The authors advocate for the utilization of institutional infrastructure, emphasizing the systematic provisions of internal technology tools to safeguard data and privacy for all users. They also emphasize the importance of instructional technology leaders and their professional competencies to assist with disseminating technology-based tools to help protect their schools and school districts in the areas of data and privacy, inclusion and equity, online learning communities, academic integrity, multi-access learning, asynchronous and synchronous technology, intellectual property, and consent. Davey (2020) adds the importance of establishing the role of educational

technology leaders in K-12 and in higher education communities to assist with selecting adequate instructional technologies that include open formats and free or low-cost software with data management, data and privacy, and cyber security being at the forefront of the platforms.

Professional development and training teachers for remote learning. In recent years, prior to the onset of COVID-19 pandemic, K-12 educators were encouraged to become more versed with distance learning to include pedagogies and technology techniques for general remote teaching and learning (Kennedy & Ferdig, 2018). COVID-19 illuminated the existing need for educators to be trained in distance education and more familiar with online technologies (Bozkurt et al., 2020). In a research study conducted by Hodges et al., 2020, it was concluded that despite the preliminary push for teachers to get more trained in educational technology, many teachers felt unprepared to implement Emergency Remote Education (ERE) to their students. In low-income countries and regions, the lack of knowledge and skills in technology is prevalent, which includes only 50% of secondary teachers trained in technology and 64% of primary teachers trained in technology (International Taskforce on Teachers for Education, 2020).

In a research study conducted by Pittman et al. (2020), findings suggest that it is essential to provide teachers with adequate broadband and new technologies to expand professional development networks and global training to enhance their knowledge, skills and abilities within their schools, school districts, and communities. Ongoing professional development for technology implementation is needed as part of updated curriculums for K-12 education to support teachers and students establish online teaching and learning routines. Additionally, providing ongoing professional development for

technology implementation for teachers and students will in turn help students take ownership of online resources and use of technology resources (Francom, et al., 2021). Huck et al. (2021), adds the importance of training and preparation for educators that will assist in enhancing their skills and development in instructional technology to help them meet the needs of all students while seeking to decrease potential achievement gaps. The authors also suggested to add instructional technology professional development in teacher certification programs, restructure, and update school district technology plans to include instructional technology professional development for all certified and non-certified personnel and allow sufficient time for educators and administrators to successfully practice and implement the new technology.

Future readiness school's framework in K-12 educational practice

Alliance for Excellence in Education, (2017) designed and developed the FRTL™ framework and adopted by the Unites States Office of Educational Technology. Since 2014, FRS has supported almost 32,000 educators, 20 million students representing the District of Columbia and 30 states, and over 3,500 school districts (Alliance for Excellence in Education, 2017). Future Ready Schools (FRS) is an over-arching research-based framework designed to inspire and guide innovation among educators through adopting strategies that ensures that each student develops the skills and passion to become responsible, compassionate, and productive citizens upon graduation. FRS is comprised of resources and tools to help school district leaders and school leadership create student-centered learning environments that are supported by evidence-based practices that stimulate robust learning opportunities for all students, regardless of location or time. The FRS network begins with leadership being the focal point. FRS

assist school district leadership and school leadership with envisioning student experiences that are required for modern learners to thrive, and which will ultimately create increased student outcomes.

A component of FRS is the Future Readiness Technology Leaders (FRTL™) framework, which illuminates strategies and policies that schools should adopt to ensure equity among all learners, while providing solid instruction, creative community partnerships, and personalized professional learning. The FRTL™ framework also builds leadership capacity, which is supported by sustainable and robust infrastructure models to assist district leadership and school leadership with providing equitable, rigorous, and flexible opportunities for students to learn (Future Ready Schools, n.d).

Curriculum design, instruction, and assessment

When applying the FRTL™ framework to curriculum design, instruction, and assessment, it provides multiple sources of academic content in its highest quality through technology-based resources. A personalized approach is used that includes more consistency and flexibility in curriculum, instruction, and assessment design. Educators' use of robust adaptive tools allows them the opportunity to adjust instruction for students in a one-on-one setting or for a group to ensure a deeper understanding of topics and issues that may be complex (Future Ready Schools, n.d).

Cheung & Slavin (2013) conducted a meta-analysis of 74 studies (including a sample of 56,886 students) examining the effectiveness of educational technology applications to enhance mathematics achievement. The findings were consistent with previous research that suggests in comparison to traditional classroom teaching and learning methods, the use of instructional technology tools in teaching and learning

produced more modest and positive educational outcomes. Additionally, Clark et al. (2014) conducted a meta-analysis that included studies examining the effectiveness of digital games to learn among students ages 6 to 25 in K-16 education. While previous meta-analysis includes game comparisons, the findings of this study suggested that games, used as a medium, stimulate and support productive learning environments. These findings are consistent and support the effectiveness of strategies emphasized by the FRTL™ framework for educators' implementation of Curriculum Design, Instruction, and Assessment to achieve student learning outcomes using technology-based solutions.

Online personalized professional development

Online learning and technology can increase and enhance personalized professional development opportunities by enlarging access to more high-quality job opportunities that are aligned with professional growth for administrators, educators, and various educational professions. This access creates an enlarged understanding of embedded-job descriptions, which ultimately creates more opportunities for student success and skillsets to increase teaching and learning in a digital educational environment. Online personalized professional development also offers administrators, educators, and technology leaders more robust opportunities to share, learn, collaborate, and produce best practices with colleagues and other professionals around the country. This type of collaboration culture is established by the district and school leadership (Future Ready Schools, n.d).

A systematic review of the literature conducted by Blitz, (2013), aligns with previous studies in its recommendations for continued use of best practices that include online professional learning practices. Best practices for professional learning practices

include capacity building within the communities, meaningful and relevant exchange of educational philosophies, diverse group membership, and encourage strong leadership. In a mix-methods study conducted by Gamrat et al. (2014), over a 3-month period within the school year, approximately 36 teachers who had completed 154 professional developments sessions were examined. Given that teachers were able to customize select content and levels of assessment, professional development opportunities were more personalized and without constraints, thus giving teachers the opportunities to curate and select relevant content. This case study informs future research to support personalized learning practices for educators.

Financial sustainability of digital learning environments

It is important for leadership at the school districts, state, and federal levels to have a deep understanding of the school finances, as they develop, review, and guide the budget and resources of the school. Leveraging the use of digital technology to foster teaching and learning requires the use of both short term and long-term budgeting, and strategic planning to enhance student learning by funding a digital environment. It is essential that school budgets are aligned with the appropriate funding streams that are cost efficient and centered upon student learning. The schools and school districts' budgets should also include the development of accountability and sustainability measures for the digital learning environment (Future Ready Schools, n.d).

During COVID-19, schools and school districts found themselves in rapid need of funding to build and sustain their digital learning environments. Through garnering support from state and federal funding distributions, school districts were able to gain student access to Wi-Fi connectivity and technologies to support learning (Wharton-Beck

et al. (2022). Additionally, the acquisition of funding to help sustain learning continuity also helped to bridge the inequity in access to technology, therefore positioning schools to better serve their school communities.

Supporting learning through collaborations, community, and partnerships in digital environments

The FRTL™ framework emphasizes the achievement of learning goals should include a digital technology-based infrastructure that supports learning through collaborations, community interactions, and partnerships. This is supported through the integration of social media networks, online communities, web tools, and digital library resources providing a median for interactions to occur that include peer-to-peer, peer-to-teacher, parent-to-teacher, and beyond the school community. An aspect of this is for district leaders to build digital citizenship among learners such that they have the capacity and ability to exchange information in a safe and secure online learning community which ultimately results in supporting the achievement of learning outcomes (Future Ready Schools, n.d).

McKemmish et al. (2012) emphasize the importance of creating a space for community partnerships when working with technology systems to ensure the flow of information as this plays a significant role in building communities, addressing disparities, support resilience, and stakeholders' health and well-being. During COVID-19 the ability for schools and school districts to develop plans for engaging community partners was critical to supporting and ensuring learning continuity. This was revealed in the findings of the study conducted by Wharton-Beck et al. (2022) in which participants described the power of community partnerships in enabling their schools to respond to

their digital resources needs to gain access to Wi-Fi through engaging with service providers as well as food and supplies through vendors. During this crisis, schools revisited and restructured their practices in communicating with parents and students by leveraging a variety of technology tools that included text messaging, social media, online platforms, and automated voice communications (Wharton-Beck et al., 2022).

Comprehensive digital learning environment infrastructure

The FRTL™ framework promotes the integration of a comprehensive learning environment that supports anytime, anywhere learning that is flexible and adapts to different levels of student competencies and abilities. This requires that school districts have digital learning infrastructures that are high quality with seamless connectivity and broadband access which supports instructional technology leaders and educators' efforts in ensuring student success. This includes having quality, adequate, and equitable access to technology for all students and staff; establishing sound policies and monitoring the safety, privacy, and security of the network infrastructure; commitment toward a proactive orientation in providing the necessary technical and instructional support to teachers and learners that prepare them to use new technologies and minimize the need for interventions during the learning process; and continuously monitoring the health and state of the technology infrastructure (hardware and software) and making upgrades and changes as needed (Future Ready Schools, n.d).

According to Lim (2013), engaging teachers and instructional technology leaders in the development of policies for the integration of technologies for instructional use. In their study, Wharton-Beck (2022) gives account of administrative participants' descriptions of involving teachers and staff during COVID-19 pandemic in decisions and

discussions surrounding the restructuring of the curriculum and lesson planning for instructional delivery through distance learning. This was important to ensure that teachers' autonomy and creativity in developing lesson plans and delivery of instruction was preserved.

Further, the U.S. Department of Education (2014) asserts the importance for schools to be equipped with high-speed broadband internet connectivity to ensure learning continuity among learners in K-12 education. However, the authors note the social issue that surrounds access to high-speed internet in rural and in low-socio-economic school communities which disrupts student learning in these communities at a disproportionate rate. The issue of inequitable distribution of technology surfaced in the findings in the study conducted by Wharton-Beck (2022), highlighting the challenges experienced by school administrators during COVID-19 with connecting with students and their families to distribute educational technologies to them to support distance learning.

Summary

Reform efforts in K-12 education has been met with the integration of technology in classrooms to guide instructional delivery in student learning. Prior to COVID-19 pandemic, many policies were implemented to support teacher and learner use of technology to enhance the achievement of learning outcomes. This involved a push for the use of a variety of digital learning tools and distance learning as a modality for educating learners. Despite this, the onset of COVID-19 pandemic illuminated a lack of preparedness among schools and school districts in transitioning from traditional classroom settings to technology-enhanced learning environments where instructional

delivery occurred using remote, hybrid, and distance learning modes. This health crisis heightened the need to train and equip instructional technology leaders to effectively support teachers, students, and staff in their schools to maintain learning continuity and attainment of educational goals.

Various challenges were faced by K-12 schools and school districts which were related to a lack of preparedness, lack of funding, insufficient infrastructure, inequitable access to technology, curriculum design, instruction, and assessment, and issues of data and privacy, safety, and security. Although many schools faced unique challenges, those that adopted strategies that aligned with the FRTL™ framework positioned their schools for future readiness with technology at the forefront of maintaining and continuing educational and student learning progress. These strategies included providing professional development support to educational stakeholders, redesigning curriculum while maintaining teacher autonomy, enhancing equitable access to educational technologies, developing and implementing a sound communication, collaboration, and partnership plan, securing funding, adequately monitoring and managing technology infrastructure, and building digital citizenship among student learners.

CHAPTER III – METHODOLOGY

Introduction

This chapter serves as an essential guide to the research methodology used to explore the lived experiences of K-12 Instructional Technology Leaders in southeastern Mississippi amid the challenges posed by the COVID-19 pandemic. The chapter begins by delineating the qualitative inquiry method chosen for this research and provides a comprehensive rational for its selection. Additionally, it furnishes an overview of the research design and its underlying justification, elucidates the researcher's role, expounds on the research setting and research participants, and delves into the particulars of the research instrument.

Furthermore, this chapter will delve into the intricacies of the data collection methods and procedures, the data analysis techniques utilized, the considerations for ensuring validity and reliability, and the ethical principles that governed the research. To conclude, the chapter will encapsulate the essential details highlighted throughout its contents in a comprehensive summary.

Research methodology

Utilizing qualitative research as the chosen methodology for this study holds significant advantages in exploring the experiences of individuals or groups as they navigate a particular phenomenon. Qualitative research allows for a naturalistic approach to interpret these experiences, delving into the "how" and "why" of a phenomenon rather than the "what," "when," and "where' that quantitative research typically addresses with variables and numbers (Tisdale & Merriam, 2015). This study is to capture the essence of the challenges, strategies, and lessons learned by K-12 instructional technology leaders

during the abrupt shift to fully online instruction amidst the COVID-19 pandemic. This emergent and inductive approach, characteristic of qualitative research (Dworkin, 2012), is well-suited for such a purpose.

Phenomenology research design

The choice of phenomenology as the research design for this study stems from its alignment with the study's research questions. Phenomenology, as philosophical foundation, or qualitative inquiries, prioritizes the descriptions of experiences over the observation of worldly objects (Polkinghorne, 1989). To comprehensively explore the experiences of K-12 instructional technology leaders during the pandemic, the phenomenology research design provides an ideal framework.

The phenomenology research design involves the description of an individual's or group's feeling or emotion, memory, thought, or perception of embodied experiences (Moustakas, 1994). Phenomenological researchers explore the common features, meaning, or essence of an event or experience (Starks & Brown-Trinidad, 2007). Unlike case studies, which often gather biographical information and events leading up to the phenomenon (Van Manen, 1990), phenomenology homes in on the essence of the lived experience of a group of instructional technologists (Colaizzi, 1978).

This study employed a phenomenology research method. It aimed to conduct a close analysis with thick descriptions of the lived experiences of instructional technologists, capturing fresh, complex, and rich descriptions of the phenomenon as it was concerted lived. Phenomenology enabled an understanding of how meaning is constructed through embodied perception, emphasizing the importance of participants' perspectives and the context in which they operated (Creswell & Poth, 2016). This

method allowed for a deep dive into the unique, lived experiences of the participants and uncovering of the context and meaning they attributed to the phenomenon (Seidman, 2013).

By selecting phenomenology as the research design and relying on interviews as the primary data source, this study was well-prepared to achieve its goal of gaining profound insights into the experiences of K-12 instructional technology leaders during the sudden transition to online instruction. Phenomenology's focus on describing experiences and capturing their essence through close analysis perfectly aligned with the research questions.

Researcher role

The researcher played a multifaceted role, serving as a listener, observer, interpreter, and reporter of participants' expressed accounts. Additionally, the researcher endeavored to understand the feelings and thoughts of the research participants' concerning their lived experiences. This task involved inviting participants to share deeply personal and sometimes challenging experiences. These experiences were difficult to discuss. It was of utmost importance for the researcher to ensure the protection of both the participants and their data.

With seven years of experience, the researcher possessed the necessary training and certification (CITI) in ethical conduct related to human subjects' research. Furthermore, the researcher holds the status of a subject matter expert in Instructional Technology and Design, bolstered by academic pursuits as a PhD candidate. This background and knowledge were indispensable for effectively engaging with K-12 instructional technology leaders.

Bracketing

In qualitative research, bracketing is a method used to validate data and guide data analysis by requiring researchers to set aside their assumptions and ensure the faithful representation of participants' lived experiences (Ahern, 1999). Reflexivity is a component of bracketing, often employed by qualitative researchers to recognize and honestly assess their own interests or values that might influence the research study (Porter, 1993). The researcher used reflexive journaling to document any subjective biases, acknowledge any potential role conflicts or personal biases that could impact the data collection and analysis, identified any gatekeepers' interests, address any potential lack of neutrality, and record surprising or new insights that arose during the data collection and analysis process.

To preempt any potential misunderstandings that may arise during the research process, the researcher employed bracketing through reflexive journaling (Tufford & Newman, 2012). This type of journaling aided in mitigating biases that may have inadvertently influenced the phenomenological inquiry approach.

Research settings

The research settings included one urban school district – Hattiesburg Public Schools (HPS), and three rural school districts – South Delta School District (SDSD), Forrest County School District (FCSD), and Clinton Public School District (CPSD).

Hattiesburg public schools

HPS is in Forrest County and is categorized as an urban school district in a small city (NCES, n.d.). HPS contains five elementary schools, one middle school, one high school, and two academic centers. Its population consists of 3,853 students with a

student-to-teacher ratio of 13.22, and the number of students with Individualized Education Programs (IEP) is 567 (NCES, n.d.). The Academic Programs and Professional Development department assists the superintendents by supervising and supporting K-12 curriculum and instruction as well as professional development (HPS, n.d.). In the department, the HPS Professional Learning Academy, which has instructional technology leaders, professional development leaders and support specialists, provides quality professional learning sessions and 1:1 support. They offer a variety of training sessions that will help teachers increase student engagement and achievement. Some of the technology training resources they offer include Schoology, Google Classroom, Google Suite, Go-Guardian, and more (HPS, n.d.).

South delta school district

SDSD is in Sharkey County and its locale is categorized as a rural, remote school district (NCES, n.d.). Its population consists of 618 students with a student-to-teacher ratio of 11.01. Within SDSD, there one elementary school, one middle school, one high school, and one vocational complex (NCES, n.d.). The mission, vision, and goals of SDSD are aligned with the belief that all integrating technology into their teaching and learning mechanisms will help to foster enhanced instructional delivery to their students (SDSD, n.d.). The technology department at SDSD has implemented enhanced technology infrastructure through mobile devices and Wi-Fi internet connectivity throughout school property (SDSD, n.d.).

Clinton public school district

CPSD is in Hinds County and its locale is categorized as a rural school district (NCES, n. d.). Its population consists of 5,196 students with a student-to-teacher ratio of

17.37, and the number of students with Individualized Education Programs (IEP) is 1,781 (NCES, n.d.). Within CPSD, there are four elementary schools, two middle schools, one high school, one alternative school and one vocational complex center. The Technology Department at CPSD currently focuses on the implementation of Information Technology hardware to ensure sustainability of their network infrastructure (CPSD, n.d.). In efforts to maximize student success in all CPSD students, 2,200 MacBooks and 4,300 iPads have been distributed to students (CPSD, n.d.)

Forrest county school district

FCSD is in Forrest County and its locale is categorized as a rural school district (NCES, n.d.). Its population consists of 2,226 students with a student-to-teacher ratio of 13.09, and the number of students with Individualized Education Programs (IEP) is 452. FCSD consists of one elementary school, four attendance centers, and one high school (FCSD, n.d.). FCSD recognizes that technology is a great resource and the school district's goal is that each student is equipped with the necessary technology tools to support academic progress, meanwhile, ensuring digital ethics. The school district emphasizes digital citizenship for students and school personnel through its eight cross-curricular units of digital citizenship, which includes: 1). Internet safety, 2). Cyber-bullying, 3). Information literacy, 4). Relationships & communication, 5). Creative credit & copyright, 6). Self-image & identity, 7). Digital footprint & reputation, and 8). Privacy & security (FCSD, n.d.).

Participants

Participants of this research study included: K-12 instructional technology leaders, an academic coach, a gifted teacher, and two elementary school teachers from

public school districts throughout Mississippi. These included Forrest County School District, Hattiesburg Public Schools, Clinton Public School District, and South Delta School District. There was one official instructional technology leader in this research study. The remaining participants held roles or job responsibilities as instructional technology designers, technology coordinators, technology coaches, integration specialists, eLearning specialists, and/or innovation specialists.

Sampling techniques

Non-random sampling technique was employed to select participants for the current study, specifically using purposive and snowballing methods. Purposive sampling involves the researcher defining the criteria used to select sample participants (Palinkas, et al. 2015). These criteria are designed to yield the most credible information regarding the phenomenon under investigation (Crossman, 2020). In this study, the sample comprised instructional technology leaders, instructional technology designers, and/or instructional technology specialists. Purposive sampling was deemed appropriate as it ensured the selected participants met the established criteria. Snowballing was utilized when these participants, who met the criteria, referred other potential participants who also met the criteria. This technique is often employed when dealing with populations that are well-defined but hard to reach (Djamba, 2002). Given the scarcity of instructional technology leaders in rural Mississippi public schools, snowball sampling was a suitable choice for this study.

Sample criteria

The criteria used to qualify participants for the current study include individuals who: 1) have been employed in a K-12 school in southeast Mississippi from March 2020

to the present; 2) were employed in a K-12 school district for at least two years prior to the onset of COVID-19 pandemic; 3) worked in a role to support student-teacher outcomes in the use of technology for teaching and learning for at least two years before the onset of COVID-19 pandemic; 4) held a role as an instructional technologist, instructional technology designer, instructional technology director, or an academic coach.

Conversely, participants were excluded if they: 1) had not been employed in a rural K-12 school in southeast Mississippi from March 2020 to current; 2) had not been employed in a K-12 school district for at least two years before the onsite of COVID-19 pandemic; 3) had not worked in a role supporting student-teacher outcomes in the use of technology for teaching and learning for at least two years before the onsite of COVID-19 pandemic.

Sample size

The anticipated sample size for this study was 8-10 participants. Typically, in phenomenology qualitative research, the sample size is often smaller than that used in quantitative research because qualitative research aims to achieve the in-depth understandings of a phenomenon or to uncover the real-life meanings focusing on the "why" and "how" of a situation, process, issue, or social interactions. The actual sample size for this study was five. According to Creswell (2013) and Polkinghorne (1989), in a qualitative, phenomenology research study, a sample size of 5-25 (or until data saturation has been reached) is sufficient.

One crucial factor in determining the desired sample size was whether the sample was homogeneous or heterogeneous. In the case of a heterogeneous sample, a larger

sample size is needed. The current sample was homogeneous as participants came from rural schools within the same geographical region, resulting in unique but similar experiences. Consequently, data saturation was achieved with the sample size of five.

Sample access

Purposive sampling was employed to facilitate the identification and/or access to participants who met the specific, narrow criteria, ensuring that those providing the most credible information related to the research study's topic were included. Snowball sampling also aided in gaining access to preferred participants for this research study, with one qualified participant referring another.

The principals of each respective schools (who served as gatekeepers) were sent an email (Appendix B) to request access to be granted to the researcher to conduct research involving their employees. Following approval from the principals and Institutional Review Board (IRB), a recruitment email (Appendix C) was sent to potential participants of the research study. The recruitment email outlined the significance and purpose of the study. The email emphasized the confidential nature of participant information and identity, assured participants of the voluntary nature of their involvement, and provide a brief description of the research methods used to collect information regarding their experience as instructional technology leaders in their schools during the COVID-19 pandemic. An incentive was also offered for participation.

Data collection

In the current study, data was collected through a pre-questionnaire (Appendix D) and two rounds of interviews. First, participants were asked to complete a pre-questionnaire that served to qualify them for the study. Next, those who met the criteria

participated in two semi-structured interviews. Interviews were chosen as a data collection method because they facilitated one-on-one interaction between the interviewer and the participants. This method allowed for the collection of in-depth descriptions of a phenomenon as participants provided explanations and accounts of their experiences, behaviors, and opinions (Creswell & Poth, 2016). This method also enabled the interviewer to observe and document non-verbal cues and actions, adding contextual depth to participants' accounts of their experiences. After the data collection from the interviews, thematic analysis was undertaken to gain a deeper understanding of the phenomenon. Finally, the researcher conducted a member check by following up with participants.

Pre-questionnaire

The pre-questionnaire was used to determine the eligibility of participants for inclusion in the current study and to gather descriptive information about the subjects. The questionnaire comprised a series of questions that collected demographic data, including institution type, grade level, type and duration of professional development training, years in the current role, current educational degree held, professional title, gender, ethnicity, age, and a desired pseudonym.

Interview questions

A semi-structured interview protocol (Appendix E) was used, containing general open-ended questions designed to guide the interviews and elicit open-ended data. The researcher used these open-ended interview questions to explore participants' beliefs, feelings, and thoughts regarding their lived experiences in their role as instructional technology leaders in their respective schools from the onset of COVID-19 pandemic to

the present. These open-ended questions also prompted participants to share sensitive or personal issues related to their lived experiences.

Seidman's three interview series method

A modified version of Seidman's (2013) Three-Interview Series was the method that was used to conduct the interviews. This method allowed participants two different occasions to share their lived experiences as instructional technology leaders in their schools during the onset of COVID-19 pandemic, as opposed to using the one-interview method. All data were captured within the first two interviews, a third interview was not conducted. The use of only one interview method in qualitative research lacks the ability to capture the context of the participants' lived experiences (Seidmans, 2013, as cited in Locke et al., 2014). The modified version of Seidman's Three-Interview Series method helped to establish a trusting relationship with the participants, which allowed the participants to share different aspects of their lived experiences at both interview times. Participants were able to share information about their general life history, details of their experience as an instructional technologist or similar role at their schools during the onset of COVID-19 to present, and their interpretations of their experiences. Each interview had its own unique focus. One one-hour interview and one forty-five-minute interview was conducted with each participant. The data were collected in each interview consist of the following:

Interview 1: Established the context of the participants' experience and the participants reconstruction of the details of the experiences in the context in which it occurred. The focus of interview one was to gain an understanding of what led the participant to their current role as an instructional technology leader or a similar role. The

purpose of this interview was to learn about their focused life history as it related to the experiences that led them to their current role. Questions presented to the participants were started by asking "how" so that the participants could reconstruct the details of their focused life history in the context of their family, school, and work experiences.

Additionally, the focus of interview one was to gain an account of the participant's detailed experience in their current role as an instructional technology leader or similar at the onset of COVID-19 and during the school year. The data collected here sought to allow the participant to reconstruct the intricate details that described their day-to-day experiences as their schools adjusted to the sudden occurrence of the COVID-19 pandemic. Particularly as it related to their experiences with curriculum, instruction, and assessment; personalized professional learning; robust infrastructure; budget and resources; community partnerships; data and privacy; use of space and time; collaborative leadership on student-centered learning. Furthermore, the interview explored the participant's relationships with school and district leaders, staff, teachers, and students during this period. The researcher used prompts that illicit details from the participants through stories about their experience.

Interview 2: The participants reflected meaning of their experiences. The focus of interview two was for the participant to reflect on their experience of going through the COVID-19 pandemic in their role as an instructional technology leader in their school. The reflection of their experience was based upon the participant situating themselves in the context of where they are now compared to where they were before (and how things are now compared to how things were before). The aim was to allow participants to make intellect and emotional connections between their work and life experiences as it relates

to the impact of COVID-19 pandemic. For example, the researcher asked the participant "Given what you have said about life and your experiences as an instructional technology leader in your school before the COVID-19 pandemic and what you have said about your experience during the pandemic, what did these experiences in your role mean to you right now in your life?"

Follow-up questions

The researcher implemented follow-up questions as a procedural measure to establish structure for both the participant and the researcher during the interviews. Additionally, follow-up questions were used after data transcriptions as a mean to revisit participants for data clarification when necessary.

Data collection procedures

After obtaining approval from school district principles to interview their instructional technology leaders, the researcher administered a pre-questionnaire via an initial mass email to each teacher at the schools. The purpose of the pre-questionnaire email was to ask for their participation in the research study, as well as a questionnaire (developed in Qualtrics) was used to identify potential participants who qualified to participate in the research study based on the sample criteria.

The pre-questionnaire email also asked the participants to recommend other instructional technology leaders that they know who qualified for the study. After receiving responses from potential participants, those who agreed to participate and met the sample criteria were then scheduled an appointment for Interview One. Each participant was scheduled interview times using a link to a Doodle poll. The researcher followed-up via email with each participant to confirm the dates and times in which

interviews were conducted and how they would be conducted (via Zoom). Non-respondents were sent a follow-up email approximately one to two weeks after the initial email was sent. In the event selected individuals did not respond, additional instructional technology leaders were contacted as needed. Prior to the start of Interview One, the researcher shared the overall purpose of the study, read the informed consent (Appendix A) to the participants which re-iterated confidentiality would be maintained with the reporting of the findings, and gained participants' permission to proceed. The researcher also advised the participants of the recording of the Zoom interview. Following the first interview the researcher scheduled a second interview with the participant and sent a follow-up email confirmation. Each interview lasted from forty-five minutes to an hour.

During each interview, a semi-structured interview protocol was used. The researcher asked interviewees open-ended questions to gain information pertaining to their lived experience as instructional technology leaders in their schools during COVID-19 pandemic.

Informed consent

To uphold research ethics, the researcher ensured a comprehensive level of informed consent was provided to each participant. This process involved communicating to the participants that their participation was entirely voluntary, and there was no pressure to respond immediately. Additionally, the researcher explained the study's purpose, assured participants of the confidentiality of their participation, and acknowledged that the interview scripts would be fully disclosed once the data had been analyzed. The researcher also requested explicit oral consent from the participants before commencing the interview process.

Data analysis

The data analysis phase focused on achieving clarity and interpreting the information garnered from participant interviews to derive meaning from the collected data (Merriam & Tisdell, 2016). Descriptive analysis was performed on pre-questionnaire data to describe the characteristics of the sample participants. Colaizzi's (1978) method of analysis, consisting of seven steps, was used to analyze the interview data. Subsequently, bracketing (reflexivity) was utilized to elucidate and eliminate the researcher's judgement from the data analysis process. Below is a description of the components encompassing the analysis of phenomenological data.

Software

Following the conclusion of the interviews, the data collected via audio and video recording was transcribed using Zoom. Zoom offers transcription capabilities and option for recording both video and audio data, and it is accessible for both Macintosh (MAC) and personal computer (PC) users. Zoom provides a range of features, including file management, video player, multi-channel control, and variable speed playback (NCH Software, n.d.). In this study, the researcher used Zoom to transcribe the data collected from interview recordings. Microsoft Word and Microsoft Excel was also used for organizing and analyzing the data into themes.

Descriptive analysis

As outlined by Nassaji (2015), descriptive data analysis is a valuable tool for qualitative researchers to identify and capture recurring themes, concepts, or patterns derived from participants, setting the stages for further evaluation and comparison. The researcher used descriptive analysis to examine and record demographic data extracted

from the pre-questionnaires, which was instrumental in characterizing the demographic composition of study participants. The demographic data encompassed various factors, such as participants' job titles, years in current role, gender, school region, type of school.

Content analysis

Following transcription of interviews, data was analyzed. The software, NVivo, was used for content analysis to review the transcribed data, identify significant statements, code, and categorize data into themes, and explain the findings. NVivo provides a comprehensive and robust approach to ensure the credibility and reliability of the data collected from qualitative research methods. It offered a systematic framework for exploring underlining themes through content analysis of participants' accounts of their experiences. The content analysis in this research study comprised the following seven steps:

Step 1: Reading the transcripts to become familiar with the participants' statements.

Step 2: Repeated review of the transcripts to identify and highlight significant statements.

Step 3: Compiling the statements to assess their meanings.

Step 4: Categorizing and grouping statements into common themes.

Step 5: Describing the findings based on the conceptual framework.

Step 6: Explaining the findings in relation to the phenomenon under study.

Step 7: Reaching out to interviewees for further information as needed.

Trustworthiness

Peer review

To enhance the validity and reliability of analyses conducted and themes developed, the researcher engaged subject matter experts in the field to conduct peer review. This process entailed debriefing the analyses and interpretations with peer members who also provided constructive feedback. The aim of the peer review was to establish consensus and agreement regarding the credibility of the findings.

Member checking

Upon the completion of data analysis, the researcher then initiated member checking to ensure data validation. Participants received a copy of the interview transcriptions to review and offer feedback on their accuracy. The researcher provided participants with the option to review a report summarizing the emerging themes and key factors. These themes and factors were identified bases on their accounts s as instructional technologists in the K-12 sector during the COVID-19 pandemic. The purpose of this member checking process was to enhance the trustworthiness and accuracy of the research findings.

Ethics

All research participants received an informed consent memo, via email, which included the necessary components stipulated by the University of Southern Mississippi Institutional Review Board (IRB). Additionally, participants received comprehensive documentation via email, outlining the research study's purpose, potential benefits, associated risks, research procedures, and a confidentiality statement. The researcher also emphasized to the participants that they retained the freedom to withdraw from the

research study at any time. The informed consent process also sought the participants' permission to use any information obtained during the research study in subsequent publications, with the use of pseudonyms where needed. IRB memos were meticulously developed and distributed to participants prior to the commencement of data collection to ensure adherence to ethical guidelines.

Summary

This chapter furnishes an overview of the application of a qualitative inquiry for the current study, accompanied by a compelling rationale for its selection as the primary method for delving into the lived experiences of K-12 Instructional Technology Leaders in southeastern Mississippi throughout the COVID-19 pandemic. Data were collected through semi-structured interviews with instructional technology leaders using Seidman's (2013) Three-Interview Series method, as appropriate. Descriptive analysis was used to scrutinize and document participants' demographic data, and NVivo software played a pivotal role in the process of content analysis to unearth and clarify the meaningful themes derived from the collected data. Chapter 4 will report the findings.

CHAPTER IV – FINDINGS

Introduction

This chapter presents an overview of the findings derived from a phenomenological research study that delves into the lived experiences of K-12 Instructional Technology Leaders in Mississippi during the COVID-19 pandemic. First, there will be a description of participants' demographic profiles. Next, the findings from a thematic analysis of transcribed data will be presented in three main categories, which address research questions and components of the conceptual framework. These categories include the lived experiences of instructional technologists, barriers instructional technologies experienced, and lessons learned by instructional technologists.

Findings

Participants

The pre-screening questionnaire was distributed to nineteen potential participants. Among these participants, two did not respond, five did not meet the inclusion criteria, and twelve met the inclusion criteria for participation in this study. Out of those who met the criteria, twelve expressed their willingness to be contacted for further engagement. Ultimately, five participants scheduled interviews, constituting the sample size for this study. According to Creswell, J. (2013) and Polkinghorne, D. (1989), five to twenty-five participants are sufficient for qualitative, phenomenology research study. Following is a description of the demographic profiles of study participants.

The participants were employed in K-12 public school districts spanning from North Mississippi, Central Mississippi, and to Southeast Mississippi. Among the five

participants, four were women, and one was a man. Their ages ranged from 25 to 54. Four participants identified as African American and one as Caucasian.

Regarding their experience in K-12 Instructional or Educational Technology, the number of years ranged from 5 to 10 plus years, with an average of 7 years in their current role. Four participants taught at the elementary grade level, while one participant had been exclusively involved in Instructional or Educational Technology. All participants had at least a bachelor's degree, and 80% of them had obtained a graduate degree.

For an in-depth overview of the participants' demographics, please refer to Table 1. Throughout this chapter, pseudonyms are used to maintain participant confidentiality.

Table 1

Participant Profiles

Participant Name (Pseudonym)	Highest Degree Attained	Age (Years)	Ethnicity	Gender	School District	Job Title	Years in Role	Years as IT Leader
Brittany	Specialist degree	25-34	African American/Black	Female	Clinton Public School District	General Ed Teacher	10	10
Dr. Fry	Doctorate degree	45-54	African American/Black	Male	Hattiesburg Public School	Instructional Technologist	10	10
Lilian	Master's degree	45-54	African American/Black	Female	Forrest County School District	3rd grade Math Teacher and Math Department Head	5	4
Mary	Master's degree	35-44	White	Female	Clinton Public School District	Classroom Teacher	2	0
Susan	Bachelor's degree	45-54	African American/Black	Female	South Delta School District	Gifted Teacher and Job Specialist	25	17

The lived experiences of instructional technologists

Findings of this study demonstrated that participants' experiences led them to their current role in supporting the implementation of instructional technology within their schools. These experiences provided insight into their level of preparedness in their role at the onset of COVID-19. Additionally, participants shared their experiences related to their day-to-day tasks as their schools adjusted to the impacts of COVID-19 on their curriculum, instruction, and assessment, personalized professional learning, robust technology infrastructure, budget and resources, data and privacy, use of space and time, and collaborative leadership. They discussed how they leveraged community partnerships to ensure the continuation of student-centered learning by implementing or enhancing the use of instructional technology tools. Below are the findings drawn from participants' narratives of their lived experiences.

Previous experiences. All five participants had diverse backgrounds in K-12 education that paved the way for them to become instructional technology-inspired teachers, academic coaches, or district-wide instructional technologists, given the availability of funding streams to support these positions.

Lilian graduated from a high school without a clear career path but felt a call to teach through prayer and meditation. She has been in education for over 25 years and has assumed various roles and responsibilities, including elementary school teacher and behavior modification teacher. Currently, Lilian serves as the instructional technology-inspired academic coach at her school district in Southeast Mississippi. She engages in professional development by attending technology conferences so that she implements

robust technology tools to students and teachers in her school district. Lilian is also a part of the administrative leadership at her school district.

Brittany has been an elementary school teacher for 10 years in Central Mississippi. She has adeptly leveraged instructional technology to enrich her teaching methodologies and elevate her technological proficiency. She taught various grade levels and actively engaged in ongoing technology research, diligently keeping herself updated on the latest technological tools and innovations to enhance her teaching interactions with students. She is recognized as a technology enthusiast in her school, which lacks an official instructional technologist position.

Dr. Fry is a dynamic instructional technologist with an extensive background deeply rooted in authentic instructional technology. With over a decade of experience in education, Dr. Fry's journey includes a rich tapestry of instructional technology elements. Notably, he has played a pivotal role in transitioning his school district in Southeast Mississippi from minimal technology usage to a 1:1 student-device ratio and mobile device integration. He further expanded his expertise by actively participating in instructional technology conferences, fostering both knowledge and professional connections. It is worth noting that Dr. Fry's path to becoming an instructional technologist was driven by self-motivation and a genuine passion for technology, as he does not have extensive experience as an elementary school teacher. Since assuming the role of instructional technologist, Dr. Fry has taken additional steps to enhance his qualifications. He pursed and obtained teacher certification through the alternate route to teacher certification.

Mary's upbringing exposed her to the teaching profession through her father's career as a schoolteacher. She pursued a career in Biology, and her robust background in Biology played a pivotal role in her successful pursuit of an alternate route teaching license. With over nine years of teaching experience in various capacities, including school counselling, Mary currently holds the position of an Instructional Technology-Inspired Science teacher. She has been instrumental in introducing new technology to her school in Central Mississippi, incorporating technology into her daily classroom instruction and assisting colleagues in technology implementation.

With a wealth of knowledge and extensive experience in education, Susan obtained her current role as the school district's only gifted teacher. Despite having worked in education for over 20 years, her previous job roles differed significantly from those of a schoolteacher or instructional technologist. Within her school district in North Mississippi, she previously served as a job specialist, drop-out prevention specialist, and reading interventionist. Susan' journey toward her current role as a gifted teacher took a unique path. She obtained an alternate route teaching license in special education, providing her with the opportunity to transition into her current position. In her role as a gifted teacher, Susan has leveraged various components of instructional technologies to introduce her gifted students to the wider world.

Day to day experiences. Findings of this study show the participants' day-to-day experiences implementing instructional technology tools in curriculum. Participants' accounts of their day-to-day experiences during the onset of the COVID-19 pandemic ranged from task-oriented actions, shifts in their role, and adjustments to comply with IT requirements. Though the participants have varied backgrounds and job titles, all

participants feel as though they have a responsibility to share new and innovating technology tools with students and teachers alike within their schools and school districts as the day-to-day experiences are similar for all participants. All five participants noted that they assist teachers with implementing instructional technology tools and they use technology daily for instruction. Some of the instructional technology tools that were mentioned by all five participants include the use of Schoology, Google Classroom, and Interactive Whiteboards with touchscreens and Airplay capabilities. Three of the five participants shared that their current day-to-day tasks include training teachers on how to implement instruction technology in their classrooms.

Lilian exclaimed, “I was one of the teachers chosen to sit around the table on zoom to discuss how we were going to do this, and then help other teachers learn how to do it and I’m still doing it to this day.” Additionally, regarding technology implementation, Mary shared, “And so I was the point person there, because the district at the time was not really utilizing that. And so, I was one of the front-runners in using that especially in a science class versus like an Ela class.” Susan also expressed that though not her job title, she was also deemed as the staff member to ensure that some teachers received the necessary training for them to successfully use technology so that teaching and learning would continue. Susan added, “Most of the teachers that work with me in the program are retired teachers or retirement age. So, it became unofficially my job to make sure that they knew how to use technology such as Zoom.”

Additional day-to-day experiences that were shared by two of the five participants were creating instructional tutorials and videos for students and teachers as needed. Lilian stated, “So then I was solicited again to actually do [create] teaching videos where I was

in a classroom after I'd done my zoom." She video-recorded her lecture in her classroom after school hours. She would teach as if she was just talking to one student. Lilian learned how to cast videos during that process. Dr. Fry was the second participant to share the same day-to-day responsibility as Lilian. Dr. Fry mentioned, "I create instructional tutorials for teachers as well."

Fast-forward to the current responsibilities, and three of five participants expressed that their roles have not changed since the onset of COVID-19 because their schools or school districts had sufficient technology infrastructure. Dr. Fry shared, "We just needed to scale a bit at the elementary level, but we weren't starting from scratch like some schools, so that the job didn't change, the urgency of things did." Susan expressed how proud she is of her school district's transition to using technologies during the pandemic. She could use the technologies that she had learned about and used in previous years. She mentioned that her students did not like to use pencil and paper for writing when they could type it out. Using technology made her job easy as she stated,

> It makes my job so much easier, especially because, as I mentioned yesterday, I service 3 different schools, the elementary, the middle school, the high school. And there are some lessons that can be used across the board, and I could just do some minor tweaking and still use the same technology. That's what I've always done and we're still doing it.

Brittany, a peer appointed instructional technologist, added that thankfully when COVID-19 pandemic forced school closures, her school was also prepared in terms of technology. Brittany's day-to-day role that included implementing technology on a regular basis did not change, as she and her students were already accustomed to the

flexibility of technology. Each of her students had a mobile device that they used for daily classwork, homework, and assessments.

Experiences of FRTL™ components during COVID-19. Findings of this study echo each component of the Future Ready Technology Leaders™ (FRTL™) framework. According to the FRTL™ framework, the use of technology tools encourages and enhances innovation in education by recognizing the diverse responsibilities that instructional technology leaders undertake in K-12 educational settings, while affirming the fundamental principle that every student and teacher in a Future Ready School should have equal and fair access to proficient instructional technology leaders, technology resources, and inventive learning environments. Below is a synopsis of the experiences of the following components: curriculum, instruction, and assessment, personalized professional learning, robust infrastructure, budget and resources, community partnerships, data and privacy, use of space and time, and collaborative leadership.

Curriculum, instruction, and assessment

The use of instructional technology in the classroom to enhance curriculum, instruction, and assessment is a component of the FRTL™ framework that supports a rich, digital learning environment. All five participants, in their own way, expressed how the proper use of technology implementation allowed them to help develop Future Ready learning environments that were supported by rich technology that included opportunities to create and integrate advanced digital resources for curriculum, digital tools that foster enhanced procedures, processes, and protocols for instruction, and reliable technology tools that enable flexible assessments. However, given the abrupt transition to remote

learning, most curriculum, instruction, and assessments were developed and distributed from school administration, with very little flexibility to adjust as needed.

Lilian is a huge advocate for providing student authentic materials to increase their learning outcomes and using technology to achieve their school goals. She stated, "That was our focus always to develop and deliver the instruction as authentically as possible. So, we had to find new ways to do that. And technology enhances it." Lilian also expressed the difficulty of not being able to adjust instructional materials as needed for her students.

Brittany indicated that she used various technologies in her classroom. She said, "I Love our class Apple TV. The students love to use the Airplay mode. It's convenient for us in the classroom." Mary also indicated that her school had been using Canvas as teaching platform for a while although their students are not 1:1 ratio with mobile devices. According to Mary, the learning management platform, Canvas, has served as a technology tool to enhance teaching and learning experiences as needed. Dr. Fry is an advocate for Google Classroom. He has implemented Google Classroom throughout their school district years prior to COVID-19, in efforts to fast track his school district in technology implementation while exposing and encouraging the students and teachers to use more innovation.

Some participants had also been using multiple technology-based platforms for students' assessments prior to the onset of COVID-19. For instance, Susan was using technology such as Google Meets and Zoom for extracurricular activities to apply what was learned in class to practice. Her students have attended virtual field trips and virtual conferences to demonstrate their learning outcomes. Also, through Susan's heightened

use of technology, her students prefer technology instead of pen and paper in learning and assessments. Lilian appreciates how technology allows for immediate feedback from student assessments. She stated, “The immediate feedback that the students are able to receive when I upload a test through different programs, and they're able to see what they made immediately and that’s plus.” All five participants were accustomed to using technology tools for summative, formative, and even diagnostic assessments.

Personalized professional learning

Findings from this study showed that all five participants expressed that one-on-one or team personalized professional learning opportunities were utilized most frequently. The primary goals of these opportunities were to ensure teachers and students received training with instructional technology tools, to harness the instructional technology leadership capacity for future opportunities for future growth and development, and to cultivate a culture that includes innovative technology tools rooted in empowerment and trust. Lilian expressed that their school district encouraged services for parents to receive training to help children with remote learning. This kind of training increased skill development for all who received it. Dr. Fry also said that their school district provided personalized professional learning opportunities for parents to learn the instructional technology tool, Paper (a tutoring platform), to help their children at home and increase their technology skill development. Paper, the tutoring platform, was being utilized by both Lilian and Dr. Fry in their school districts.

Both, Dr. Fry and Susan shared their experiences collaborating with local colleges to provide additional personalized professional learning opportunities to their students, teachers, and parents. Reflecting on teachers at his school and their desire for more

personalized professional learning opportunities from instructional technology leaders, Dr. Fry stated, “So I went and found a speaker at a local college to come deliver professional development as well.” Susan also shared, “There is a local college here in our community that hosts workshops that we are able to attend and learn how to use different things in our classrooms.” Brittany and Mary both shared similar experiences regarding personalized professional learning opportunities at their schools.

Although they did receive some personalized professional learning opportunities, participants thought that was not enough. Brittany stated, “Now, to be honest…our district has been lacking there now, for some reason with PD [professional development].” Additionally, Mary explained that at her school, they might be left out of professional development opportunities because of the distance of the technology team and their classrooms. She commented,

> It’s like a doubled-edge sword. We have a nice technology team. If you need help just submit a ticket and they will come assist. But because of where my building is, if they offer group PD, we might get left out or overlooked because of where our building is located on campus.

Whether or not there was an existing system for professional development, participants were aware of the gaps in PD opportunities and benefits of professional development to enhance the technology skills of all stakeholders, including teachers, students, and parents. These shared accounts consisted of having personalized professional development opportunities that occurred within the schools and through collaborations with those in the community.

Robust infrastructure

A robust infrastructure ensures dependable access to technology resources such as reliable instructional technology support, software, hardware, and internet access, all which aids in the change, innovation, and growth in the K-12 educational setting. Most participants mentioned that their schools or school districts had already secured reliable technology infrastructure on their school's property prior to the onset of COVID-19. Most participants indicated that they either facilitated or received instructional technology support, utilized at least one software version for instruction, and each student had access to the internet while on school campus. Additionally, all respondents mentioned that there were some students and teachers that lived in remote areas that did not have access to the internet, which resulted in various obstacles during remote teaching and learning.

Instructional technology support: Some participants provided technology support when there is a need. Dr. Fry is a big advocate for Google Classroom. He has implemented Google Classroom throughout their school district years prior to COVID-19, in efforts to fast track his school district in technology implementation while exposing and increasing the students and teachers to more innovation. Dr. Fry added that the teachers at each school within their school district had direct access to him for support when needed. Additionally, Dr. Fry also developed instructional technology tutorials for teachers to use as needed. Dr. Fry recognized that some teachers had limited experience with technology, and he believed it was essential to provide the necessary support. He dedicated several days to creating resources, planning training sessions, and producing instructional videos to assist teachers in adapting to the new technological demands.

Mary, Lilian, Brittany, and Susan had to rely on peer-to-peer instructional technology support, as their schools did not have instructional technologists to offer such support.

Software: Most participants indicated that their schools or school districts had already implemented technology software for both students and teachers daily. Susan had been using multiple technology-based platforms for her students prior to the onset of COVID-19. Her students have attended virtual field trips and virtual conferences by using various software components. Dr. Fry utilized Google classroom within his school district. In addition, both Lilian and Dr. Fry integrated Paper, a tutorial platform, into their classroom teaching in their school district.

Hardware: Most participants stated that their schools or school districts had already established technology access by equipping each student with a mobile device, such as an iPad or a Chromebook. Brittany expressed, "I came in the district in 2015, and we have always had all students in technology, one to one." Additionally, Susan added that all her students had mobile devices and they had already spent numerous hours with remote learning because their school district already services students in rural areas, so they were already prepared.

Dr. Fry was also proud to share the accomplishments of his school district. He shared that his school district sent home a Chromebook with every student. He said, "We immediately at that point started to take all Chromebooks out of the carts and sent home a Chromebook with every student." Lilian shared how her school adapted and transitioned to ensuring technology device access to students. She explained that "Prior to the onset of COVID-19, our school was not 1:1 with mobile devices. Our students were not equipped with 1:1 mobile devices until the beginning of the following school year."

However, not all participants were enrolled in the one-on-one program. Mary's school district was not in the program so her students lacked necessary hardware. This will be discussed in the barriers section.

Access to internet: All participants stated they had access to internet while on school campus, however, there were internet access issues at home for some students and teachers, as they lived in rural areas. Susan had been using internet as a means of teaching and learning with her students long before the COVID-19 pandemic. Susan even reported that her school buses were already equipped with Wi-Fi prior to the onset of COVID-19 so students were able to do homework on the bus before arriving home. According to Susan,

> Our students did not have issues with not having internet at home because all our buses were equipped with Wi-Fi, so the students could do their homework on the bus before they made it home. And sometimes we would have the buses park in central locations so that parents could drive their kids to that location and park near the buses, which allowed their kids to have access to the internet (Susan).

However, during the COVID-19 pandemic, internet access has been a big issue for the students and teachers who live in rural areas and do not have Internet access at home. This is to be discussed in detail in the barriers section.

Budget and resources

According to the FRTL™ framework, budget and resources include instructional technologists having an active role in securing needed technology resources for all students, completing reviews or audits to access the durability and longevity of technology hardware, and advocating for technology resources that are sustainable, cost-

effective, and produce advanced, high-quality media for teaching and learning. However, none of the five participants in this study indicated that they had an active role in advocating securing budget and resources for their schools or school districts.

Community partnerships

One significant finding from research underscores the profound impact of community partnerships on enriching student learning experiences, surpassing the boundaries of a typical school day. Schools and school districts that cultivate and sustain connections within their local communities have been able to tap into invaluable resources and talents, resulting in a tangible expansion of student outcomes.

Among the participants, four out of five emphasized the substantial community support received by their schools or school districts, both before and during the challenging times brought about by the COVID-19 pandemic. These collaborative endeavors have led to an array of beneficial community partnerships, including:

Local business collaborations: Schools and school districts have established robust connections with local businesses, leading to the provision of essential community resources such as mobile devices. This resource allocation has significantly facilitated students' access to modern learning tools.

Educational institutions and vocational training: Strong affiliations between educational institutions and local colleges, in partnership with local businesses, have been instrumental in offering on-the-job training opportunities for vocational-technical (vo-tech) students. These practical experiences have empowered students with valuable skills and real-world insights.

Church engagements: Several schools and districts have successfully forged partnerships with local churches, leading to a multifaceted exchange of support and resources. Such collaborations extend beyond the academic realm, enhancing the overall well-being of students.

Digital inclusivity: In response to infrastructural challenges, certain local businesses have stepped forward by extending their Wi-Fi connectivity to all students. This generous gesture has helped alleviate barriers related to unsustainable infrastructure, ensuring that students have equal access to online educational resources.

It is noteworthy, however, that one participant, Dr. Fry, reported an absence of community support in his school district or stated limited awareness of such initiatives. This underscores the importance of understanding the variability in community engagement across different educational settings.

Data and privacy

According to the FRTL™ framework, data and privacy seeks to integrate advanced levels of security and safety when implementing and using technology tools, create digital tools to protect student data while ensuring teachers and students are aware of safety policies and laws that safeguard data and privacy. The findings of this study reveal that only one participant had data and privacy tools implemented within their school district. Dr. Fry mentioned that his school district has tools in place to protect student data and ensures the safety of all data that is transmitted within their school district for all facets of remote teaching and learning. In contrast, Lilian and Mary added that they always had data and privacy concerns while remote teaching and learning. Lilian commented that there was a fear of teaching to the whole household instead of

teaching to her student, and academic integrity was also a concern because she was not sure who would be completing the assessments. Mary responded with a similar echo. She stated that there was no way to acquire private, centralized instruction during remote learning because instruction was open to everyone in the house. She also added that academic integrity was also a concern with remote learning.

Use of space and time

The need to foster and support teaching and learning regardless of location and time is referred to as one of the eight components of the FRTL™ framework.

Brittany used games as a technology tool to enhance student collaboration either in school or at home, given they have access to Wi-Fi. Describing this experience, she commented, "…they do communicate with each other through the games either in school or at home,". Mary also discussed how using technology was useful in increasing engagement between teachers and students. Reflecting on this, she explained that she was amazed at how technology allowed for such smooth collaborations between some students and teachers. In the event access to the internet was a problem, some teachers were able to collaborate at different times to meet at the school to prepare packets for their students based on grade levels. Mary expressed,

> I was amazed at how smooth it went. They were collaborating. They worked together. One teacher from the math department would do the videos one week one teacher would do on the next week, and all the students on that grade level got to see the same things. If students didn't have access, they could go to the school and pick up a packet and get the material.

Susan also added that by her own personal goals have been related to technology research, her students have always benefited from remote learning which resulted in them learning at any time or in any place.

Collaborative leadership

The FRTL™ framework supports collaborative leadership by encouraging teachers and students to use technology as an advanced mechanism to accelerate teaching and learning, encouraging instructional technology leaders to collaborate with other departments within the school and school administration to share visions of safety and trust derived from an innovative school culture. Additionally, the FRTL™ framework encourages instructional technology leaders to collaborate with school leadership to adopt and urge technology resources that are needed. However, only one of the participants in this study, Lilian, shared that she had been or was actively involved in collaborating with school leadership to adopt and integrate technology tools within her school district.

Barriers instructional technologists experienced

Findings of this study demonstrated various barriers experienced by participants during the rapid transition to remote learning at the onset of COVID-19. Among the eight components of the FRTL™ framework, the following paragraph discusses the components that participants shared as barriers. They are listed in order of importance that derived from the data analysis. These barriers included insufficient infrastructure challenges associated with remote learning, resistance to technology acceptance and use among their peers, lack of control of curriculum development, instruction, and assessment with remote learning in Central and Southeast Mississippi, decreased

opportunities for personalized professional learning, and data and privacy concerns in Central and Southeast Mississippi.

Insufficient infrastructure. Although all participants indicated that they had various hardware, software, and Internet access, there are still some shortages of technology infrastructure. Findings of this study show that one of the most overwhelming instructional technology barriers among all participants was insufficient infrastructure, specifically, internet access at home. Participants talked about different aspects of experiencing insufficient infrastructure, including unavailable internet access, and not being adequately prepared to teach remotely.

Unavailable internet access

The predominant and universally cited barrier among all participants was the unavailability of internet access in the homes of both students and teachers, primarily stemming from their residence in rural areas. As Lilian described,

> Our district is widespread because we have some very rural areas, and then we have some not so rural. But I would say, about 30% of our students had huge trouble. And I will go on also to say about 10 to 15 of our teachers, because even some of the teachers didn't have access to internet during Covid. Before we were allowed back on campus, they had to park out at their school themselves, because they had bad connection or no internet at all.

Brittany also shared her experiences with limited internet access by indicating that some teachers were allowed to enter the building during the COVID pandemic because some teachers did not have Internet access at home. However, students did not have the privileges of teachers to be driven to campus to access the internet. Mary echoed the

same sentiments as other participants as having experienced the lack of internet access for some students and teachers at the onset of COVID-19 and throughout the following school year. Although Dr. Fry, an Instructional Technologist in a South Mississippi school district, expressed that he and his school were well-prepared at the onset of COVID-19, he also mentioned that some students and teachers were lacking home internet access. According to Dr. Fry, "We were ready as a school, but the issues came from not having access to Wi-Fi at home."

Unready for remote teaching

Most participants mentioned that they were not ready for remote teaching at the start of the COVID-19 pandemic because of insufficient technology infrastructure, including hardware, software, and internet access. Lilian, a veteran teacher, academic coach, technology staff member, and member of the COVID Response Team for her school district, displayed a wealth of knowledge regarding the state of her school district upon COVID-19 and challenges they experienced. During our interviews, with a cheerful smile, Lilian expressed the need for improved infrastructure (especially internet access at home) for some students and teachers. Lilian also noted that while her school district was well versed in instructional technologies, they were not prepared for 100% remote teaching and learning. As a math teacher, Lilian thought that it was very important to show her students the steps of her work and to write it out using pencil and paper when students encountered problems. However, the transition to teaching online, disrupted this scaffolding strategy. Lilian shared that she felt things were out of control and that it was stressful not having the convenience of teaching from the classroom. Reflecting on this experience, Lilian explained,

> There are barriers that we had to overcome to get the tasks completed. One of my main areas personally was teaching from home being effective when it is online. And I teach my kids that is very important to show your work and to write it out with pencil and paper if you need to. So, it was also letting go of the control and trusting that the parents who felt ill-equipped themselves to be my teacher assistant in this world of common core, the other math that they call it.

Software

During COVID-19, many teachers had to rely upon various software platforms to continue teaching and learning. All participants shared that they were using at least one form of software in their classrooms, however, there was room for increased software use among most participants.

Hardware

To properly implement instructional technology tools during COVID-19, it was essential for students to have devices to access the internet. Most respondents had sufficient hardware, however, two participants, Mary, and Lilian, mentioned that their school district was not proactive in providing technology devices for every student pre-COVID-19. Mary expressed, “We had too many students that either hadn't purchased devices, didn't have devices, or did not have access to Internet.” Lilian added, “Our students did not have mobile devices prior to COVID-19 and that hurt us in the transition to 100% online learning stage.”

Resistance to technology acceptance and use. Findings of this study showed that most participants experienced resistance to remote teaching with more technology use. Although the participants have a rich background in instructional technology, four of the

five participants preferred the on-campus setting as opposed to remote teaching and learning, given the abrupt transition. Many teachers and administrators, who were not accustomed to heavy technology usage, found that adapting technologies in teaching was challenging. Their teaching methods were more traditional, relying on pencils, paper, and workbooks. The effort to transition these individuals to embrace technology was a significant task.

Mary shared that her school district displayed resistance to technology adoption because they had not implemented it across all grade levels as they should have, especially when compared to other schools in Central Mississippi. According to Mary, they resist technology usage because students did not have adequate hardware, software, or internet access. Additionally, Lilian shared that this resistance was one of her most significant challenges while transitioning her students from the traditional classroom setting to a remote learning environment. Lilian emphasized, “Being at home was a big barrier personally, letting go of control because you'd built a relationship with your students. I built the type of relationship with students in my classroom was like my home.”

Lilian expressed that she would rather teach her students in her classroom, an in-person setting rather than remote teaching. Even though her students are well versed with technology, they were not used to being taught online. Lilian also added that all teachers were not 100% on board with delivering instruction to their students online. Lilian noted,

> We had one or two teachers that were reluctant to change because it was difficult to learn new technologies and teach what we needed in order to try to be as successful as possible as we navigate the online teaching.

Lack of control in curriculum, instruction, and assessment. The findings of this study revealed concerns that participants had related to lack of control in their delivery of curriculum, instruction, and assessment. These concerns pertained to several aspects, including: (1) synchronously learning new instructional technologies while developing adequate curriculum conducive to remote learning, (2) maintaining their proper levels of instruction while adjusting to 100% remote teaching and learning, and (3) providing sufficient assessment opportunities for students while properly monitoring their success or the lack thereof.

Lack of control in curriculum

Prior to COVID-19, teachers were able to develop certain aspects of their curriculum to accommodate their students. Post-COVID-19, revised curriculum was administered from school administration to teachers, with very little flexibility. Susan, who was the point person at her school district in North Mississippi, shared her own experience of panic when faced with teaching unfamiliar technologies. Susan carefully explained,

> I know I was in a panic because it was not familiar. You know, you still must do lesson plans as well as try to figure things out. How do I teach these kids on something that I'm not familiar with?

Susan acknowledged her struggles with not being as prepared as she had previously imagined.

Lack of control in instruction

While adjusting to 100% remote teaching and learning, most of the participants found it difficult to maintain students' focus and attention due to various disruptions in

the students' homes or in their backgrounds. Lilian advised, "Teaching online was hard, especially with our young students. There were continuous disruptions, and the students were hardly ever paying attention." Even though some of the participants had been using technology tools with their students at a more advanced level, the onset of COVID-19 brought a realization to a few participants that implementing technology tools is helpful, but it is also quite different when teaching their students in a 100% remote setting. Brittany, the designated technology expert in an elementary school in Central Mississippi, shared her own challenges. She described the difficulty she faced when teaching her students through a camera. Brittany explained,

> How am I supposed to be effective through a camera? That is the biggest barrier not wanting to dig in and try to figure out when it's very simple, especially when you have somebody there who's trying to explain it to you and trying to walk you through it, you know. So, that's why I would say that's the biggest area other than that, you know. Once you learn it, why not use it? You know, why not use it?

Lack of control in assessment

With the abrupt transition to remote teaching and learning, it was difficult for teachers to adequately assess their students' progress due to various barriers such as no internet access, so some students were not doing their work, family members were doing the work instead of the students, or students were continuously disrupted by their backgrounds at home and therefore they were not paying attention while online. These were barriers that teachers had no control over. Brittany shared her concerns of not being able to properly grade student assessments when a vast majority of her student did not have access to internet at home or if they did have internet at home the students were

relying on their parents, grandparents, or siblings to basically teach them the classwork and prepare the students for assessments.

Decreased opportunities for personalized professional learning. Personalized professional learning is essential to the FRTL™ framework as it encourages innovation that is undergirded in empowerment and trust. The training provided should align with the specific needs of the staff. Findings for this study represent the expressions of all participants sharing the same sentiment: their respective schools or school districts could have offered more structured personalized professional learning opportunities. According to Mary,

> Many teachers, especially veteran teachers, were not adequately prepared to implement technology on a large scale, particularly in the context of 100% remote teaching and learning. This lack of preparedness led to challenges for these teachers, and some even considered retirement as a result. Even those accustomed to using technology with their students faced difficulties in transitioning to developing online lesson plans.

Brittany emphasized the abruptness of the transition to remote learning, which was a direct reflection of the lack of personalized professional learning. According to Brittany, they were in school one week and online the next week. The entire industry was in turmoil, wondering what to do. Brittany also pointed out the challenges of professional development during this swift shift. She said, “We couldn't do much. We could not have a professional development because we couldn’t come to school. We couldn’t see face to face, and nobody knew how to operate Zoom.” Lilian agreed that the rapid nature of the transition required teachers to adapt swiftly. She said, “Because I had

to learn so many new things post-COVID-19, immediately." Mary expressed her disappointment, emphasizing the disconnect during the transition. She mentioned that many teachers lacked support and were unprepared, leading to significant difficulties, and some had received little to no training. She noted, "It was a lot of disconnect, and that transition did not go smooth. Then those teachers did not have support, and they were not prepared, and it was very difficult, and some had no training."

Even if teachers had some kind of training, they might have not mastered the skills. Dr. Fry shared his frustrations about the experiences of training his teachers. According to him, at the end of training when he thought his teachers had the skills, and then quiz them. He found that they did not have the skills. Dr Fry said, "that's like end your day with an exit ticket."

Data and privacy concerns. The data and privacy component of the FRTL™ framework is critical in the context of remote teaching and learning. Concerns about data and privacy emerged among some participants, revealing a complex landscape. Most of the participants indicated their concerns that their school or school district did not have technology tools and practices in place for data protection. Two research participants had concerns about data and privacy during their transition from the traditional classroom setting to the remote teaching within their home environments. Lilian and Mary alluded to experiencing data and privacy concerns at home during remote teaching and learning. In addition, Lilian also mentioned grappling with academic integrity concerns during the abrupt transition from their traditional classroom setting.

Concerns of home environment privacy

These concerns highlighted the delicate balance required to protect both students and teachers during navigating remote learning environments. Mary voiced her apprehensions regarding the potential breach of home environment privacy. She explained,

> If you're on a zoom with 30 students, and you're at your home, you're inviting whoever's in their home to hear whatever is going on and sometimes there's not filters, you know. I mean there's no way to filter out things like that. And so, I mean, there's just not a way to protect everybody, and especially because in the district, it is mandatory for students to show their face.

Lilian shared similar concerns, referring to instances when teachers inadvertently overheard private discussions in students' households. She noted that this could lead to distractions and hinder the learning process. According to Lilian, "Everyone heard in the news that there were some things we heard in households that parents would not have wanted us to hear…." Mary also expressed concerns about her own family's privacy, explaining that her family members, like her kids or her husband, could hear the information being shared during the virtual classes. Although she tried to keep it as private as possible, she felt it might infringe upon their rights.

Academic integrity concerns

Mary expressed concerns about academic integrity and the challenges they faced in monitoring assignments and ensuring students' access to instruction during the rapid shift from the traditional classroom setting to remote learning. She said, "We had no way of monitoring assignments, we had no way to ensure students had access to remote

learning." Lilian also added that she had concerns regarding academic integrity during the abrupt shift to 100% remote teaching and learning. Lilian said, "I did not know if my students, their siblings, or other family members were actually completing the assignments."

Lessons learned by instructional technologists

Addressing the third research question, participants shared their invaluable lessons learned during the COVID-19 pandemic. The findings regarding these lessons learned encompassed various aspects, focusing on technology implementation for student-centered learning. Notably, the key lessons learned included streamlining technology infrastructure, investing in personalized professional learning, considering student learning needs and adopting a student-centric approach when planning instruction, and embracing change.

Streamlining technology infrastructure. Findings of this study showed a common point of emphasis among participants was the need for a streamlined or mandatory learning management system within the school district. Both Mary and Dr. Fry highlighted this as a crucial lesson. At Dr. Fry's school, having a mandatory learning management system already in place prior to the onset of COVID-19 really made the transition feel not as abrupt since there was already a system in place to support the continuation of teaching and learning remotely. Dr. Fry stated that his goal was for every student and every teacher to have the tools to be successful. Dr. Fry commented, "We hadn't missed anything. We hadn't missed a beat so and that's what we want to see across the board." Through his relentless efforts at getting his school district at a heightened level of technology use, years prior to the COVID-19 pandemic, the abrupt transition to

remote teaching and learning was doable. However, the main challenge faced by the instructional technologist was getting less technology-skilled teachers to utilize the LMS to its full capacity. Given this, Dr. Fry commented, "Make everything mandatory," referring to also making professional development a requirement to enhance teachers' skills using technology when there's a mandatory LMS in place. On the other hand, at Mary's school there wasn't one streamlined learning management system in place, instead each teacher had the liberty to decide which platforms to use to support remote learning. Mary described this as a "terrible" experience. Further, Mary urged proactive steps, stating, "The school district should be more proactive by having a more streamlined or mandatory learning management system in place."

Investing in personalized professional learning opportunities. Findings of this study highlight the significance of providing comprehensive personalized professional learning opportunities for teachers. Brittany stressed the importance of thorough teacher preparation when using technology platform safely. Brittany emphasized, "Well, I would say, to better prepare us, just make sure that our teachers know how to use whatever platform that we may use safely..."

Teacher preparedness levels varied across school districts. Dr. Fry reflects on his response to receiving a call from the superintendent regarding the transition to virtual learning. He describes the proactive steps he took to address this challenge. He conducted professional trainings for teachers prior the pandemic. Although teachers may not master all skills he taught, they at least had some idea about the technologies that could be used in remote teaching.

Considering student learning needs and adopting a student-centric approach when planning instruction. The findings of this study underscore the necessity of aligning technology with student-centric learning. Brittany also highlighted the importance of selecting a platform that suits student needs and ensuring teachers are proficient in its use. Brittany pointed out, "We need to decide on a platform that we're going to use, and everybody needs to kind of know that platform inside and out." For Susan, her advanced experience in using various instructional technology software, allowed her to continue to meet her students' learning needs in the remote learning environment. Pre-COVID-19, Susan was accustomed to using software such as Zoom, Prezi, Microsoft Teams, and Vimeo to create virtual worlds of experiences and exposure for her students by facilitating virtual classrooms, virtual class field trips, and hosting live guest speakers virtually to name a few. During COVID-19, she was able to adapt the use of technologies for her gifted students as well as assist school administrators and teachers with creating remote learning strategies to meet their students' needs. Further, Lilian described how COVID-19 forced her to change her approach to preparing and delivering instruction to ensure that students' learning needs were being met. Lilian explained,

> I always look at technology from the student's point of view, and not how it can enhance my effectiveness and my timeliness. As far as my delivery of instruction, I started looking at how we could do both, that was my best takeaway, because, like, I said, I have not hand graded a test since before COVID-19.

This shift in her focus was critical in embracing and adopting a student-centric approach in order to enhance her instructional practices in a technology-enhanced learning environment.

Embracing change. The findings of this study express that flexibility is crucial for ensuring uninterrupted teaching and learning. Susan pointed out the necessity for educators to embrace changes, whether stemming from crisis like COVID-19 or natural disasters like tornadoes. Susan commented,

> I think we should, as educators, be willing to embrace the necessary change that comes with it, whether it's something as detrimental as COVID-19 or as life altering as a tornado. We must be willing to do whatever it takes to make sure that teaching and learning continues, and that we can make learning as fun as possible.

COVID-19 required IT leaders to embrace change in their practices related to ensuring data security and academic integrity. Dr. Fry emphasized that they consistently prioritize student data and academic integrity. They leveraged established measures in place to ensure the security of student data. He stated, “We're always making sure that student data and academic integrity is solid. We’re not new to this.” Similarly, Brittany underlined fully taking advantage of an existing screen lock feature that she controlled on student devices, especially during assessments, to prevent unauthorized access to certain features. She emphasized, “There’s a screen lock feature that I have control of on their devices so when testing they are not allowed to access certain features.”

These lessons learned collectively illustrate the valuable insights gained by instructional technologists during their experiences supporting technology implementation in response to emergencies like COVID-19. These lessons underscore the importance of aligning educational practices with future readiness, ultimately benefiting both teachers and students.

Summary

This chapter presents the findings of a qualitative research study that delves into the lived experiences of instructional technologists from the onset of COVID-19 to the present day. The study aimed to identify the lived experiences of instructional technologists during COVID-19, barriers faced by instructional technologists experienced during this period, as well as the valuable lessons learned that emerged from their experiences. The data were collected through two in-depth interviews with each of the five participants, and a descriptive analysis approach was applied, guided by Colaizzi's Method of Analysis (Wojnar, 2007).

The five participants assumed roles of Instructional Technology Leaders in their respective schools or school districts, with representation from the north, central, and southeast regions of Mississippi. Notably, all five participants boasted substantial prior experience in the K-12 education sector, ranging from 9 to 10 years, across various capacities. Their day-to-day experiences during the initial stages of the COVID-19 pandemic were characterized by shifts in job roles, primarily due to the heightened demand for instructional technology or task-oriented actions.

In exploring the alignment of each school or school district with the FRTL™ framework that supports Instructional Technology Leaders, three participants revealed that their school or school district was already well-versed in using instructional technology tools at a considerable pace. They had also established the necessary infrastructure to support these tools, particularly for Curriculum, Instruction, and Assessment, and effectively leveraging the Use of Space and Time.

The significance of instructional technology for professional development was consistently emphasized by all five participants. They employed peer-to-peer collaboration and self-taught mechanisms to acquire new technology skills, crucial for classroom implementation. Additionally, four participants harnessed community partnerships to enhance technology resources, ultimately improving teacher and student outcomes.

However, the findings also illuminated the barriers that instructional technology leaders encountered during their transition to remote or online learning at the onset of COVID-19 and beyond. These include resistance to technology acceptance and use among peers, inadequate infrastructure in students' homes, leading to issues like limited internet access, concerns related to data and privacy, and a reduction in professional development opportunities.

In conclusion, the findings of this study shed light on the multifaceted experiences of instructional technologists during the COVID-19 pandemic. They underscore the importance of technology in education, the value of peer collaboration, and the necessity of adapting to change. Furthermore, they highlight the need for enhanced infrastructure, addressing data and privacy concerns, and providing ongoing professional development opportunities to effectively navigate the challenges posed by unforeseen circumstances such as the pandemic.

CHAPTER V – DISCUSSION, RECOMMENDATION, AND CONCLUSION

Introduction

The onset of COVID-19 caused a disruption in education, globally. Educational institutions had to rapidly transition from the traditional classroom setting to remote teaching and learning (UNESCO, 2020). In a state of emergency preparedness, many institutions faced barriers adjusting to the implementation of technology as a primary means of delivering teacher-led instruction (Quesada et al., 2020). The individuals who were responsible for overseeing and addressing these barriers were instructional technology leaders. Public educational institutions in rural regions, specifically K-12 institutions in the U.S., faced even more unique barriers to technology implementation, particularly due to resource constraints for implementing 1:1 technology devices to support remote learning (Black et al., 2020). This disruption to education either positioned schools to be better prepared for technology-enhanced learning or it revealed a gap in technology readiness that needs to be addressed to ensure future readiness to use technology to support student centered learning outcomes (Hale et al., 2020). According to FRTL™, technology leaders hold the key to supporting their schools toward future readiness through fostering innovative practices that promote teaching and learning in digital environments. As educational institutions strive to prepare for the future, it is crucial to identify and nurture leadership across all levels and roles. Technology leaders play a vital role in supporting the goals of Future Ready Schools® (FRS) through their professional expertise, programs, and learning spaces (Alliance for Excellence in Education, 2017).

Summary of the study

This qualitative study explored the lived experiences of five K-12 instructional technology leaders in rural public schools in Mississippi during and after the COVID-19 pandemic to investigate the barriers encountered in rapidly implementing instructional technology and the lessons learned from their experiences. The selection of phenomenological approach was ideal for the scope of this study, as it focused on capturing the subjective and objective lived experiences of individuals or groups (Creswell & Poth, 2018). The Future Ready Technology Leaders™ framework served as the conceptual framework for the current study. The components delineated within the FRTL™ framework define the various roles that technology leaders play within schools and school districts. Additionally, they underscore the core principle that in a future-ready school, equal access to suitable digital resources, innovative learning environments, and qualified technology leaders should be provided for all students (Alliance for Excellent Education, 2017).

This chapter presents the discussion of the findings from Chapter 4 and the implications of these findings using the FRTL™ as a conceptual framework. Further, recommendations for future research, conclusions based on the discussion of findings, and the limitations of the study are presented.

Discussion of findings

Participants' narratives of their lived experiences during the onset and progression of the COVID-19 pandemic unveiled a range of findings or themes that aligned with components of the Future Ready Technology Leader (FRTL™) framework. These findings provided an understanding of the professional and educational practices adopted

by IT leaders and the barriers they faced during the rapid integration and implementation of technology in their schools. The discussion of findings will be based on the research questions.

RQ1: What are the lived experiences of instructional technologists during COVID-19 as it relates to various elements of educational practice on student-centered learning?

Key findings for RQ1 included: IT leaders' previous experiences and school district's needs shape IT roles and responsibilities; Advocacy for technology integration into curriculum, instruction, and assessment; Promotion of personalized professional learning to enhance technology use among teachers, students, and parents; Leverage of existing infrastructure for a smooth transition to remote learning; Rarity of challenges in securing the budget and resources; Promotion of student-centered teaching and learning through community partnerships; Consideration of data and privacy issues; Support for effective use of space and time for student-centered learning through technology use; and Encouragement of technology adoption and integration through collaborative leadership.

IT leaders' previous experiences and school district's needs shape IT roles and responsibilities

According to Corbeil (2013), the roles and responsibilities of IT leaders vary based on the employers' needs and capacity of technology integration in the schools. This was reflected in the current study as participants had different paths from their life experiences that led them to their roles as IT leaders as well as held different responsibilities within their roles. Participants held titles as academic coach, instructional technologist, and teachers who had taken on IT leadership roles due to their familiarity with technologies compared to their peers. Further, their titles coincided with the level of

technology integration at their school. For example, the instructional technologist and academic coach were in a school districts that had been highly committed to investing in technologies for years (prior to COVID-19). On the other hand, teachers who had assumed IT leadership responsibilities were in school districts that had been less invested in technology integration and as a result, the schools faced greater challenges with the onset of the pandemic.

According to Delgado et al. (2015), as the delivery of education has evolved from analog to technology-based instructional tools, there is and has been a dire need for instructional technologists in K-12 education. Most of the participants in the current study were at schools or school districts that had not allotted exclusive positions deemed for instructional technologists. Instead, as supported in the literature (Richardson & McLeod, 2011; Yu & Prince, 2016), teachers at their schools who possessed heightened technology skill levels assumed dual roles as instructional technologists and collaborated with other teachers and staff to train them on implementing instructional technology strategies in their instructional delivery methods. Four of the five participants stated that they were and continued to assist teachers with technology implementation on a reoccurring basis, while two participants emphasized that they also created instructional tutorials and videos for students and teachers as needed, and which coincides with a study by Corbeil (2013) that highlights the various roles of instructional technology leaders in their schools and school districts. The instructional technologist was responsible for full technology integration across schools within the district. Only one interview participant (the “Instructional Technologist”), revealed that since 2014, their school district had been highly invested and proactive at aligning their technology-based pedagogies, instructional

strategies, and instructional delivery methods with that of the Future Ready Schools framework. Currently, their district staffs one instructional technologist, whose primary responsibility is to ensure instructional technology-based professional development to the school district's students and teachers. This paints a picture of an ideal commitment that schools and districts should have to foster student-centered learning in technology-enhanced learning environments.

Advocacy for technology integration into curriculum, instruction, and assessment. Participants in the study came from schools and school districts that had different levels of technology integration prior to the COVID-19 pandemic. Ultimately, this impacted their experiences in addressing challenges faced during the rapid transition to technology-enhanced and remote learning environments. Yet, across participants, there was a common agreement that leveraging technology integration into daily educational practices leads to a more robust curriculum design, delivery, and assessment of student learning. This echoes findings from a study conducted by Ege University et al., (2018), which revealed that the integration of technology in education improves teaching and learning abilities because of increased workability to design and develop curriculum, implement innovative teaching styles, and utilize flexible assessment practices. Further, according to Philip (2017) technology integration increases the chances of student success when technology tools are properly adopted and managed by technology leaders.

In this study, advocacy for technology integration also encompassed the implementation of advanced digital tools in curriculum development and the incorporation of digital resources to enhance instructional technology methods (i.e. Google Classroom, Canvas, Apple TV, Google Meet, and Zoom). A meta-analysis

research study conducted by Cheung & Slavin (2013) suggested that the use of technology tools in educational practices produced more positive learning outcomes in comparison to traditional classroom teaching and learning strategies. This sentiment was expressed as participants gave account of positive student learning outcomes from using authentic technology tools to achieve their school learning goals.

Among participants, the COVID-19 pandemic illuminated the value and usefulness of using digital technologies as a vehicle to support and enhance the assessment of student learning. Participants in the study incorporated the use of multiple digital instruments and platforms to allow more flexibility in providing feedback and to meet student preferences for assessing their learning outcomes. A mix-methods study conducted by Blanchard et al. (2016) supports this educational practice by revealing positive impacts on student assessments with the use of technology integration among learners in K-12 education.

Promotion of personalized professional learning to enhance technology use among teachers, students, and parents. According to Harris (2020), professional development across school stakeholders is essential for developing a future ready teaching and learning environment. Overall, participants provided accounts of one-on-one, and group professional development used to enhance technology skills and guide technology use among IT leaders, teachers, students, and parents. IT leaders Four of the five participants emphasized that instructional technology-based professional development was conducted either by themselves initiating their own, self-led professional development sessions to learn new, innovative technology to integrate in their classrooms, or by creating their own teacher-to-teacher groups where they

collaborated with each other to enhance their technology use in their classrooms. This corresponds with the findings from a qualitative study conducted by Oliveira et al. (2021), that revealed themes that most educators were responsible for their own technology development training for technology implementation. One participant added that he offered instructional technologist-led professional development sessions to all teachers within their school district, at their leisure, through the utilization of iCalendar, to schedule their professional development sessions. None of the schools or school districts that were represented in this study required their teachers or staff to participate in instructional technology-based professional development. Therefore, they sought to empower each other by collaborating to build a school culture that included technology integration. Consistent with O'Shea (2021), when PD is not mandatory by school administrators, educational stakeholders take initiative to engage in peer-to-peer professional development. According to Ali et al. (2021), it is essential that through school leadership, an innovative school culture is undergirded by empowerment and trust, and technology-based training is designed and implemented into daily use to meet the needs of all students and teachers.

Leverage of existing robust infrastructure for a smooth transition to remote learning. Schools that had technology infrastructure in place prior to COVID-19 experienced a smoother transition to remote learning compared to those who were faced with developing and employing a technology implementation strategy at the onset. Additionally, schools who had students who lived in remote areas experienced unique challenges with access to internet infrastructure. According to the FRTL™ framework, robust infrastructure is an initiative where Instructional Technology Leaders are tasked to

remove barriers to effective education and to make certain students and teachers have dependable access to technological recourses. This includes ensuring sufficient hardware and software and equitable and reliable access to internet at school and at home for short-term and long-term sustainability (Alliance for Excellent Education, 2017).

Four of the five participants expressed there were few changes in their daily educational practices during the onset of COVID-19 because their schools had a sufficient, existing technological infrastructure. This experience aligns with conclusions from a study conducted by Hodges et al. (2020). The comprehensive analysis conducted by Hodges et al. (2020) explored the transition to online learning during the COVID-19 pandemic and their findings illuminated the significance of pre-existing instructional technology infrastructures in facilitating a smoother transition, in line with observations made in K-12 schools. Readily having access to existing technology, one-to-one devices, and widescale implementation of technology meant that IT leaders were prepared to guide their schools during the rapid shift to remote learning during COVID-19 and make necessary adjustments as needed (Dibner et al., 2020).

In this study, IT leader preparedness led to participants being able to share new and innovative technology tools and advocate for technology integration into curriculum, instruction, and assessment. In the schools that had existing robust technology, participants shared that they were able to implement a plan to make sure that all students had access to a Chromebook, school buses were already equipped with Wi-Fi, and hotspot boxes were offered to students that lived in rural areas. Having these things established, made the transition to remote learning not as abrupt as it was for the schools that did not have existing infrastructure.

Although most schools had access to internet on the school's campus, COVID-19 revealed deficiencies in the infrastructure for broadband internet access to support remote learning. Participants whose schools did not have existing robust technology prior to COVID-19 shared that there was no access to internet for some students and some teachers and this led to some students being behind due to the lack of available technology resources. This is contrary to Borup et al.'s (2020) insistence of equitable access of technology for all students and teachers. This lack of internet access can be explained as some students and teachers lived in rural areas and did not have access to internet as well as some schools did not invest in technology integration as much as other schools due to lack of funding. According to Liu (2021) digital disparities (i.e., inadequate access to digital technologies and internet) existed prior to COVID-19 due to a lack of federal funding, especially in rural and low-socio-economic area, and this was exasperated with the onset of COVID-19. As a push to improve technology infrastructure, these schools later issued their students one-to-one mobile devices as a result of receiving federal funding. Additionally, they implemented an alternative approach to support remote learning by distributing paper packets to students without internet.

Rarity of challenges in securing budget and resources. In this study, none of the participants were aware of any challenges in securing budget and resources for instructional technology-based needs. As an added layer of clarity, none of the participants advised that they had been a part of the leadership discussions that determined the purchasing and comparisons of various technologies used for teaching and learning in their schools or school districts. However, these findings did not align

with practices outlined in the National Education Technology Plan (2017). The NETP (2017) calls for strong leadership that takes on a collaborative approach by engaging educational stakeholders in re-evaluating and re-allocating technology budgets to meet educational objectives and exploring new digital learning tools and digital learning environments to transform teaching and learning. Additionally, a comparative study by Richardson et al. (2018) added the heightened level of importance for technology leaders' role to encompass decisions that are directly related to securing appropriate technology tools in school districts.

Promotion of student-centered learning through community partnerships. Prior to and during COVID-19, community partnerships played an essential role in building collaborations and creating opportunities that strengthened and supported student-centered learning. Ferreira (2020) emphasized the need for and importance of building community and community partnership as a strategy for overcoming challenges during times of crisis. Participants recounted their experiences of building collaborations with local businesses and churches to secure needed technologies (innovative learning tools, Wi-Fi, online educational resources) and other resources and utilizing their affiliations with other educational institutions to support vocational training opportunities. These experiences of community collaborations corroborate with the findings from Bryk et al. (2015) that underscore the significance of cultivating community partnerships to bolster educational resilience, focusing on the importance of social capital and community engagement in education.

Teaching and learning opportunities are greatly enhanced when schools and school districts develop strong relationships with their communities. Such relationships

will maximize teaching and learning beyond the regular school day. According to Alliance for Excellent Education (2017), providing learning spaces for parents and community partners encourages out-of-school partnerships. By leveraging community resources and talents, students can achieve better outcomes. Four out of five participants mentioned that their schools or school districts received significant community support both before and during COVID-19. According to the FRS framework, community partnerships help to expand student learning opportunities beyond existing classroom hours and the confines of the school walls by establishing meaningful connections the schools or school districts and families, caregivers, faith-based institutions, local businesses, and organizations (Future Ready Schools, n.d.). Similarly, Fishbane and Tomer (2020) reported that following the onset of COVID-19, schools and school districts sought aid from alumni, educational private and public organizations, for socio-economic interventions. These interventions included aid such as food, medical, and psychological support for residents and students, as well as securing commitments from internet service providers to offer free internet access for educators and students (Fishbane & Tomer, 2020).

Leveraging community resources and talents help to expand student outcomes. Wharton-Beck et al. (2022) conducted a study that revealed findings where participants described the power of community partnerships that enabled their schools to respond to the needs related to digital resources and the need to gain access to Wi-Fi by collaborating with service providers as well as obtaining supplies and food through vendors. Four of the five participants expressed that their schools or school districts had received an overwhelming amount of community support pre-COVID-19 and during

COVID-19, which aligns with a study conducted by Masterson et al. (2023). Some of the community partnerships that were mentioned included: strong connections between the schools or school districts and local businesses to provide community resources such as mobile devices, strong connections between their schools and school districts with local colleges and local businesses to provide on-the-job training for vo-tech students, church adoptions, and local businesses made their Wi-Fi connectivity available to all students to help offset barriers related to unsustainable infrastructure. Additionally, a focus group conducted by Carson et al. (2020), also revealed the importance of leveraging community partnerships to gain access to novel opportunities to offset the need for resources.

Consideration of data and privacy issues. The current study's finding revealed that most schools did not have in place adequate considerations to address data and privacy issues at the onset of COVID-19. Only one participant recounted that data and privacy measures had already been implemented (for several years) at their school with the rapid transition from the traditional classroom setting to 100% remote teaching and learning. A study conducted by Prinsloo et al. (2019) revealed the importance of safeguarding student data during online or remote learning. The study examined Massive Open Online Course (MOOC) sources that were in various regulatory and geographical environments while investigating user consent and data collection from prospective users. Conclusions from findings emphasized that there should be a requirement for enhanced transparency concerning the consequences of granting consent to utilize potential users' data during the registration process (Prinsloo et al., 2019). One participant's school district had similar measures in place to protect student and teacher data while remote

teaching and learning practices took place. Further, Kerres (2020) urged enhanced data security and safety measures to all virtual and remote teaching and learning practices.

Most respondents in the current study raised concerns of data and privacy issues in their teaching and learning practices in remote learning environments during COVID-19. As the world has witnessed teaching and learning practices pivoting online, Bozkurt et al. (2020) disclosed issues related to digital footprints that may be left unattended in the online and remote learning communities. Examining 31 countries affected by COVID-19 and the abrupt transition to online or remote learning Bozkurt et al. (2020) emphasized that data privacy, ethics, and surveillance should be addressed with heightened levels of importance. Two participants' responses mirrored the suggestions of Bozkurt et al. (2020), as they also exclaimed the importance of data and privacy and how the issues should be taken into high consideration.

Support for effective use of space and time for student-centric learning through technology use. The effective use of space and time was described by participants as the strategic use of technology to leverage its affordances for creating space for peer-to-peer and peer-to-teacher communication and engagement, both inside and outside the classroom, and at any time. Instructional Technology Leaders are responsible for alleviating barriers that obstruct teaching and learning but ensure technology access to all students and teachers (Alliance for Excellent Education, 2017). Given this, the effective use of space and time with technology integration ensures a student-centric approach to teaching and learning. All five participants implemented technology tools in their classrooms to enhance their classroom instruction, pre-COVID-19 and during COVID-19; thus, creating a rich digital learning environment to undergird curriculum, instruction,

and assessment. Technology not only provided a medium for collaboration among students to complete school assignments, but teachers also leveraged technology to collaborate on delivering curriculum instruction to multiple classes within grade levels. This also created opportunities for learning to occur at different time periods, including outside of regular school hours.

Additionally, at the onset of COVID-19 and the rapid transition to remote teaching and learning, all five participants continued to use technology tools that they were familiar with. Two of the five participants emphasized that, pre-COVID-19, technology integration was not utilized to its fullest capacity by teachers to deliver instruction. According to two testaments from this study, since COVID-19, teachers are gaining confidence in using technology tools to enhance social interactions among students and to organize instructional strategies to foster teaching and learning. As such, Means et al. (2017) advises the importance of technology implementation and enhanced interactive and personalized teaching and learning experiences. which are consistent with the findings of student-centered teaching and learning being a focus of curriculum, instruction, and assessment.

Encouragement of technology adoption and integration through collaborative leadership. Findings of this study indicated that some teachers became a part of a leadership team that was formed as a result of COVID-19, in order to strategically move forward with the abrupt transition to 100% remote teaching and learning. The study's participants illuminated the value of developing a leadership team and the added structure it provided for supporting strategic decisions to address the challenges faced as a result of the pandemic. This aligns with Alliance for Excellent Education's (2021) call for a

heightened emphasis on developing school leadership and utilizing the technical capacity to leverage human capital in all departments throughout the schools and school districts.

RQ2: What barriers did instructional technologists experience during the COVID-19 pandemic?

The major findings of RQ2 comprised: Greater infrastructure challenges in remote (in-home) learning environments; Teacher resistance to technology use in curriculum, instruction, and assessment; Increased demand for personalized professional learning due to COVID-19; and Heightened data and privacy concerns with rapid transition to remote learning.

Greater infrastructure challenges at remote (in-home) learning sites. A significant challenge experienced by participants in the current study was the transition to remote learning. Consistent with findings from Noor et al. (2020), the instructional technology leaders encountered challenges that included the lack of preparedness for technology-based instruction to support remote learning, internet connectivity issues, and limited infrastructure. According to Hodges et al., (2020), at the wake of the COVID-19 pandemic there were various technological challenges that surfaced including students' access to technology to support remote learning at home. There was no exception to rural Mississippi schools and school districts, which also succumbed to technology-based infrastructure deficits (Royals, 2020). In this study, all five participants expressed the following, most common themes regarding insufficient infrastructure: 1) some students and teachers did not have access to internet from home because they lived in rural areas where internet was not accessible, and 2) locations for access to public Wi-Fi were not widely communicated to all students as needed. Wharton-Beck et al. (2022) found that

strong partnerships and communication between schools and community members were significant in bridging the gap in digital resources to support remote learning and in reducing disparities in access to Wi-Fi technology during COVID-19. This was the case with some participants in the study as their school districts who leveraged their partnerships with local businesses to raise awareness of public Wi-Fi and internet access during the pandemic.

Teacher resistance to technology use in curriculum, instruction, and assessment. In a year filled with COVID-19 pandemic chaos, a reoccurring theme among the research participants was the ill-preparedness of most teachers when using technology for remote teaching and learning. Additionally, research participants felt a lack of control in implementing technology-enhanced curriculum, instruction, and assessment practices at the onset of COVID-19. This led to teachers' resistance to the use of technology as a tool to enhance their instructional strategies.

Case study research conducted by Chandra et al. (2020) found that K-12 teachers' reluctance to using technology existed even pre-COVID-19, with preferences toward traditional classroom instructional delivery. According to Royals (2020), prior to the onset of COVID-19 pandemic, teachers were not intentional with creating innovative learning environments for their students. However, they recognized the need for professional development in this area and urged for administrative-enforced instructional technology professional development to support and enhance teaching and learning practices in technology-enhanced learning environments. It is the responsibility of Instructional Technology Leaders to lead and train teachers into the effective use of technology while supporting educational goals to improve the delivery of curriculum,

instruction, and assessment (Cheng, 2020). Ertmer and Ottenbreit's (2013) research highlight the crucial significance of teacher preparedness and buy-in to successfully achieve technology implementation in K-12 education.

According to the FRS framework, teachers' use of robust, adaptive technology tools allows them opportunities to adjust learning modules for students to ensure a deeper understanding of issues and topics that may be complex (Future Ready Schools, n.d). However, during the abrupt transition to remote learning at the onset of COVID-19, participants shared that there was little flexibility in adjusting delivery of curriculum and instructional due to school administration's immediate control and heavy focus on disaster management. This inflexibility was met with using unfamiliar technologies to carry out typical instructional delivery tasks, maintaining control of student behavior and performance in remote learning environments, and monitoring student progress in the midst of dealing with barriers to internet access. This experience is consistent with Adedoyin and Soykan (2020) who note that during the rapid emergence of COVID-19, educators and students were faced with unsustainable design and development of technology implementation.

Teacher technology unpreparedness and heightened need for personalized professional learning due to COVID-19. During the in-depth exploration of this research study, it was found that COVID-19 illuminated the importance and need for the integration of technology to support learning in the classroom. This was substantiated in the establishment of public policy set forth by The National Education Technology Plan (NETP), reinforcing the need for and importance of effective technology implementation in education (Tondeur et al., 2017). Study participants' accounts revealed that when there

was a lack of instructional technology-based professional development pre-COVID-19, it yielded a rapid, difficult, but mandatory learning of technology for classroom integration by teachers. This also highlighted the need for more professional development in technology to support curriculum, instruction, and assessment. Three of the participant testaments declared that there were teachers who experienced challenges due to the immediate integration of technology at the onset of COVID-19, because of either the non-existence of technology implementation pre-COVID-19 or very little or optional technology implementation pre-COVID-19. This led to a lack of teacher preparation in those school districts and therefore, there was a need for enhanced training for teacher's effective implementation of technology for teaching and student learning (Hubers et al., 2022).

Findings from Harris' (2020) study revealed that for the impact of professional development to be realized, the push for professional development should come from school and district leadership to foster buy-in from stakeholders. Mouza (2020), conducted research that focused on technology implementation in K-12 education and the importance of personalized professional learning. This study amplified the need of advanced professional development sessions, trainings, and programs to properly prepare teachers for technology implementation, which was evident at the onset of COVID-19 pandemic. Similarly, Francom, et al. (2021), conducted a study that highlighted the need for ongoing personalized professional learning opportunities in K-12 instructional technology implementation as it will help encourage ownership of technology and online resources for both teachers and students.

Participants in this study provided examples of how professional development opportunities can be leveraged through self-motivation. For example, participants increased their technology skill development by taking college courses and engaging in peer-to-peer training. These findings are aligned with a recent study conducted by Huck et al. (2021) that amplifies the significance of preparing and training teachers in enhancing their development and skills in instructional technology – which will ultimately enhance the teachers' ability to help meet the needs of all students, whether online or in-person.

Heightened data and privacy concerns with rapid transition to remote learning. Consistently across participants in the study, there were shared sentiments of enhanced concerns of ensuring data security, data privacy, and data safety in the remote learning environment – particularly as it relates to home environment privacy and academic integrity. Outlined as one of the principles in the FRTL™ framework, data and privacy can be achieved by developing and enforcing protocols that prioritize student data privacy and implement strong safety, security, and tools (Gamage et al., 2020).

Four of five participants shared that in some cases, their instructional content was open to all households during remote learning, and they felt that tools should be in place to offset the sharing of too much information with those that were not students. Additionally, participants alluded that academic integrity was always a concern with the rapid transition to remote learning and the participants did not feel assured that their students' data was secured. Only one participant shared that data and privacy was not an issue for their school district. Their school district was already accustomed to 100% online learning at various times throughout their school year, pre-COVID-19, which is

aligns with sound practice as highlighted in the research conducted by Dibner et al. (2020). According to Huang et al. (2020), it is crucial for technology leaders to provide training to teachers and school staff on data security, data privacy, and on the expectations, policies, and laws related to data and privacy. Additionally, in their research on data and privacy in K-12 instructional technology, Zheng et al. (2020) expressed the importance of having data security practices and protocols throughout online or remote teaching and learning. Their study highlights the importance of the role of instructional technologists to advocate safeguarding data privacy and academic integrity.

RQ3: What lessons were learned by instructional technologists as it relates to educational practices that align with the future readiness of their school?

In response to RQ3, participants conveyed valuable insights about lessons learned that comprised of: Streamlining technology infrastructure; Providing opportunities for personalized professional learning; Considering student learning needs and adopting a student-centric learning approach; and Embracing and adapting to the changes coming with technology implementation.

Streamlining technology infrastructure. The most concisely expressed lesson that was learned across multiple research participants was the need for schools or school districts to implement one LMS across all grades that is inclusive of all subject areas. The findings of this study align with the findings of Wharton-Beck et al. (2022) that most instructional technology leaders agreed that during COVID-19, school districts employed sufficient LMS across their school districts to support the delivery of remote learning and distance learning materials. This reinforces the need for a concise LMS to be implemented in schools and across school districts. Further, the sentiment of one

participant in the study echoes Harris' (2020) who contends for a commitment for providing professional development opportunities to enhance educators' confidence and competence in using technology to support learning in technology-enhanced environments. Additionally, with this in place, requiring teacher professional development in technology use was important to ensure the use of the LMS at its fullest capacity. Alliance for Excellent Education (2017) encourages collaborative leadership among technology leaders, school, and school district leaders to develop an innovative vision of teaching and learning using robust technology.

Providing personalized professional learning opportunities. Participants commented the need for district-wide implementation in streamlining technology use and believed that the use of technology should be mandatory for teachers. This response aligns with the research study conducted by Zheng and Smaldino (2020), that emphasizes the understanding that well-trained instructional technology leaders are more prepared to navigate throughout transitions and adjustments when crisis occur. Reflecting on the rapid transition to remote learning, two participants held similar sentiments that educators should not be afraid to learn more technology or use technology. Sterrett and Richardson (2020) adds that the success of technology integration in educational institution are the responsibility of well-prepared instructional technologists and their ability to effectively train teachers and students. The findings of this current study support recent literature that encourages K-12 educators to become more familiar with distance learning to include technology techniques, technology tools, and pedagogies for remote teaching and learning (Kennedy & Ferdig, 2018). Since COVID-19, Bozkurt et al. (2020) illuminates the pre-existing need for teachers to be more skilled in online or remote learning and the

implementation of technology tools. Additionally, in a research study conducted by Pittman et al. (2020), findings suggest the importance of providing teachers with adequate technology tools and broadband to help enhance personalized professional learning opportunities and training that yields more technological skills, knowledge, and abilities within their school districts, schools, and communities. These findings are aligned with the findings of the current study.

Considering student learning needs and adopting a student-centric learning approach. The findings of the current study highlighted a shift in perspective, moving from personal effectiveness to considering technology's impact from the student's point of view. Participants in the current study emphasized the importance of situating the student perspective when making decisions about the type of learning platform to use and ensuring that users were proficient in using the platform. According to DeLuca et al. (2017), when choosing a teaching and learning platform, it is important to choose a platform that is student-centered, but also includes school curriculum standards. Generally, the platform of choice is either endorsed or developed by certified educators or qualified institutions.

Additionally, a theme among participants was the importance of adapting the use of software and technology tools to meet individual student learning needs. The platform should be structured in a way that both teachers and students are encouraged to accelerate in its use (DeLuca et al., 2017). In alignment with some of the participants adjustment to their instructional delivery to meet students' learning needs, DeLuca et al. (2017) endorsed allowing space for student engagement through quizzes and activities and content designed for all learners (advanced and remedial). Participants discussed

augmenting the use of various learning technology tools to engage students in the remote learning environment. According to the U.S. Department of Education (2016), technology-enabled teaching and learning tools help learners connect and comprehend visual abstract concepts. Further, augmented reality software and three-dimensional software are some examples, which were used by some participants in the study, reinforcing student-centered learning.

Additionally, participants agreed on the importance of keeping students' needs at the forefront when implementing teacher training of technology integration and use and adjusting the approach to instructional delivery from the students' point of view. Mishra and Koehler (2020) conducted research based on the Technological Pedagogical Content Knowledge (TPACK) framework, highlighting that teacher training in technology use should include emphasize content knowledge and pedagogical knowledge. These are critical knowledge for effectively implementing technology in education to meet the diverse student needs, which aligns with the thought and suggestion of one of the participants of this study. One participant highlighted the significance of aligning technology with the needs of the students by selecting a student-centered platform that ensures educators' proficiency in its use. This finding is aligned with the overarching, research-based framework, FRS, that ensures the establishment of an innovative school culture. Central to this framework is the commitment to placing student-centered learning at the forefront of all decision-making processes (Future Ready Schools, n.d.).

The research conducted by Means et al. (2017) highlights the critical nature of adopting a student-centric approach in technology integration. Their research amplified how technology can have a positive impact on student learning through enriching

personalized and interactive learning experiences. One participant shared that moving forward beyond COVID-19, instructional technology integration should first focus on how instructional practices can be enhanced from a students' perspective. Using a student perspective when preparing curriculum and instruction in a technology-enhanced learning environment, helps to situate the student as the focus of teaching and learning. The student-centric teaching and learning approach allows students to individually matriculate throughout their coursework and have more opportunities to self-regulate their learning compared to the traditional teacher-centric approach (Lee et al., 2022). Implementing a student-centric approach to teaching and learning meets the needs of both teachers and students while preparing them for an increasingly, ever changing world of technology (An & Mindrila, 2020). One participant encouraged the student-centric approach as it enhances her timeliness and the students' effectiveness, in addition to increasing the effectiveness of classroom instruction.

Further, other lessons learned expressed from participants included taking time to reflect on what worked and what did not work with technology implementation and these lessons learned and takeaways point to creating technology-enhanced environments that support student-centered learning.

Embracing and adapting to the changes coming with technology implementation. Participants commonly agreed that embracing and adapting to changes brought on by COVID-19 that led to a heavy reliance on technology in educational practice was critical. Areas where adaptation and changes occurred the most were related to ensuring the security of student data across technology infrastructures as well as ensuring academic integrity with the onset of remote learning. According to Simmons (2022), at the onset of

an emergency related instance such as COVID-19, embracing such change affords more positivity and flexibility for both students and teachers, when all teaching and learning has shifted from the traditional classroom setting to remote or online teaching and learning. While there are some growing pains associated with an abrupt change, one participant noted that it is essential for all educators to embrace chance as it encourages teaching and learning to continue, allows for increased levels of cognitive presence, greater flexibility, and improved peer-to-peer collaboration. Voogt et al.'s (2018) research indicates the importance of teachers embracing technology and technological innovation while disseminating teaching and learning opportunities to students. Additionally, a sentiment of one of the current study's participants aligns Voogt et al.'s (2018) research that amplifies the significance of adjusting and having flexibility across educators and administrators during crisis such as COVID-19 pandemic.

Implications

The FRS framework outlines how technology leaders can guide schools in their transition to innovative digital learning and lead the transformation. In doing so, innovative educators develop their practices, programs, and learning spaces with the cutting-edge approaches happening in schools today by aligning their strategic initiatives with the FRTL™ framework.

The principles outlined in the FRTL™ framework identify the diverse roles that technology leaders fulfill within schools and school districts. They also emphasize the fundamental belief that in a future-ready school, all students should have equal access to appropriate digital resources, innovative learning environments, and qualified technology leaders (Alliance for Excellent Education, 2017).

The study's findings provide indications for IT leaders' alignment of their professional practice with the FRTL™ framework to support their schools towards fostering future technology readiness. This is accomplished through implementing educational practices that foster student-centered learning in technology-enhanced environments. The findings support that these educational practices should inform the development of IT leaders' efforts towards commissioning for their schools. First, schools should maintain a robust technology infrastructure and streamline district-wide technology implementation. Second, IT leaders should collaborate with administration and stakeholders to increase budget and resources to support technology integration efforts. Third, there should be equitable access to technology resources for all students. Fourth, school administration, working with IT leaders should promote self-motivated and district/school-led professional development opportunities. Fifth, policies and measures to enhance data and privacy across technologies supporting remote learning should be established. Finally, sixth, collaborative teaching and learning should be promoted through establishing flexible technology infrastructures that allow learning to occur in various formats, and at different times and places, making effective use of space and time.

Recommendations for practice

COVID-19 changed the landscape of educational practice, globally. IT leaders were at the forefront of the rapid transition from traditional learning to remote learning. As IT leaders are the gateway to positioning schools toward becoming Future Ready Schools, the lessons learned, and key takeaways provided by participants in the current study are useful in establishing recommendations for practice. Findings of IT leaders'

lived experiences supported the idea that proper technology implementation in K-12 educational settings helps foster effective utilization of technology which can facilitate the development of Future Ready learning environments. The 2017 National Education Technology Plan emphasizes the piloting, design, alignment, and integration of technology in K-12 education (U.S. Department of Education, 2017). These environments were bolstered by comprehensive technological integration, encompassing the creation and integration of advanced digital resources into the curriculum, the utilization of digital tools to enhance instructional procedures and processes, and the use of dependable technological tools to enable flexible assessments.

As the FRTL™ framework focuses on the professional practice of IT leaders, it places an emphasis on their collaborations with multiple stakeholders (administrators, teachers, students, parents, and community partners) as the key to fostering a culture of student-centered learning through effective implementation and integration of instructional technology. IT leaders in this study provided insight from their lived experiences of considerations that should be made as IT leaders forge alliances and strategies to support schools toward sustainable educational practices centered on the implementation of technology that withstands disruptions to learning. IT leaders working with schools/districts should:

1. Develop a contingency plan that can withstand the unanticipated event of a natural disaster that will shift educational practice.
2. Try to create a culture where educators, students, and parents alike are positioned to embrace change and have an open mind, with willingness to grow, rather than

be debilitated by fear at the introduction of technology to support curriculum and instruction.

3. Vocalize what's working to enhance individual learning and be prepared to take action to ensure that teaching and learning continue effectively.
4. Be selective of appropriate online teaching platform that are appropriate for all grades and subject areas.
5. Implement or increase data and privacy tools for technology use.
6. Create opportunities for professional development not only for IT leaders but also teachers and parents to support student learning.
7. Forge opportunities that increase teacher and parent collaboration through technology platforms.

Limitations

This study was conducted after the onset of COVID-19 and asked participants to reflect and recount their lived experiences as Instructional Technology leaders during COVID-19. Due to the gap in time since the onset of COVID-19 when the impact was immediately felt, participants' memory and remembrance of that experience may be distorted and their ability to fully recount details of that experience. Further, the intended sample of the study was 8-10 participants, however, 5 participants agreed to participate. This may present a limitation to the robustness of the findings; however, each participant was interviewed twice, allowing for data saturation through repeated measures of participants lived experiences. Finally, the researcher comes into the study with their own biases from personal experience with this phenomenon. Acknowledging these

biases, the study focused on the lived experiences of participants and therefore, allowing for self-reports of the phenomenon.

Future research

This study explored the lived experiences of IT leaders in rural schools and school districts during COVID-19 using a qualitative phenomenological inquiry approach, and the findings provide a grounding for future research. From this, future research can extend on the sample of IT leaders examined in this study to further investigate the phenomenon to examine the differences in lived experiences among K-12 IT leaders from diverse school populations and in both rural and urban regions to gain an understanding of the impact of school size and location on the phenomenon. Furthermore, the current inquiry allowed for in-depth understanding of participants' lived experiences with the phenomenon, however, it does not provide accounts from those whom IT leaders interacted with that may have shaped their experiences of the phenomenon. Given this, future research can expand the current study's findings to include the accounts and perspectives of other educational stakeholders who were collaborators with IT leaders during the disruption to teaching and learning due to COVID-19. To accomplish this, future research can employ a phenomenological approach focusing on stakeholders' interactions with IT leaders during this phenomenon to gain a holistic understanding of the lived experiences.

To enhance the triangulation of the current study's findings, a mixed-methods approach can be employed. First, survey-research can be used to examine and compare differences in the experiences, barriers, strategies employed, and lessons learned by K-12 IT leaders regionally in the U.S. Second, case studies and ethnographic research can be

conducted with school sites where IT leaders and school administration have adopted the FRTL™ framework to further examine and observe the implementation of educational practices post-COVID-19 that support Future Ready Schools. These findings can help further inform policymaking and evidence-based strategies that can be implemented by IT leaders, especially for those at schools that have not adopted the FRTL™ framework. Lastly, future research can employ a longitudinal research method to examine the impact of changes in the educational practices of IT leaders and their schools over time, beyond COVID-19.

Conclusions

The aim of this study was to gain an understanding of the lived experiences of Instructional Technology leaders from rural schools and school districts during the rapid transition from traditional to remote learning during COVID-19. Tasked with being at the forefront of this rapid, critically important transition (Jordan, 2020), instructional technology leaders encountered technological difficulties that were illuminated at the onset of COVID-19. Educational institutions worldwide were dependent upon technology to prevent further disruptions to their teaching and learning practices (Black et al., 2020).

K-12 educational institutions faced unique challenges due to their different levels of technology preparedness, capabilities, and levels of technology affordances (Benalcázar et al., 2021). Despite this, the current study highlights key strategies employed by IT leaders and their schools that can position them toward achieving student-centered teaching and learning goals and outcomes when technology use is at the forefront of educational practices. Implementing the Future Ready Technology Leaders™ framework delineates the way IT leaders facilitate the shift towards more technology use

in schools. The FRTL™ framework outlines distinct strategies through which IT leaders can spearhead this transformative process. Furthermore, through the strategic alignment of school and school district initiatives with the FRTL™ framework, these forward-thinking educators integrate their methods, programs, and environments with the contemporary innovative practices observed in schools today (Future Ready Schools, n.d.). The principles delineated in the Future Ready Technology Leaders™ framework recognize the diverse roles that technology leaders play within schools and districts. They reinforce a fundamental belief that, in a future-ready school, every student should have equal access to proficient technology leaders, digital resources, and cutting-edge learning environments. To achieve this, requires coordination and buy-in from multiple educational stakeholders.

Through collaborations between IT leaders and educational stakeholders (including school administration, teachers, students, parents, community leaders) (Future Ready Schools, n.d.), the study's findings point toward a focus on establishing robust infrastructures, ensuring sufficient budget and resources to support equity and access of technology to all students, providing opportunities for professional development on technology use for stakeholders, leveraging the use of space and time to enhance collaborative learning, increasing privacy and data security features across technologies, and leveraging community partnerships to support student-focused learning outcomes.

Overall, the findings from the current study provide an actionable guide to IT leaders of professional practices they can implement that align with the Future Ready Technology Leaders™ framework to ensure student-centered learning environments. Although IT leaders are appointed the role of commissioning their schools towards future

technology readiness, it is essential that school district and administration understands their needs for enhancing their professional practice and that they have the backing and support to become effective Future Ready Technology Leaders (Alliance of Education, 2017).

APPENDIX A – Informed Consent

TITLE OF STUDY: The Lived Experiences of K-12 Instructional Technology Leaders During COVID-19

Researcher: Robin M. Jackson Protocol Number: 22-1622

INTRODUCTION

This informed consent is for a dissertation in the School of Leadership, College of Business and Economic Development at the University of Southern Mississippi (Gulf Park Campus), conducted by Robin M. Jackson. The purpose of this research study is to examine in-depth, the experiences of K-12 instructional technology leaders in Mississippi rural school districts by exploring the challenges faced, strategies employed, and lessons learned by instructional technology leaders during the period of COVID-19 pandemic when traditional classroom instruction was shifted to fully online instruction.

As a result of meeting the following criteria, you have been invited to participate in this study:

1. have been employed in a K-12 school in southeast Mississippi from March 2020 to current.
2. employed in a K-12 school district for at least two years prior to the onset of COVID-19 pandemic.
3. work in a role to support student-teacher outcomes in the use of technology for teaching and learning at least two years prior to the onset of COVID-19 pandemic.
4. have a role as an instructional technologist, instructional technology designer, instructional technology director, or an academic coach.

PROCEDURES

Upon agreeing to participate in this study, be informed there will be three separate interviews, as well as, additional conversation or contact, if deemed necessary by the researcher. Each interview will be conducted virtually and will be video and audio recorded using Zoom. You will receive the Zoom link prior to starting the interview. A summary of each interview is listed below:

1. Interview 1: Establish the context of the participants' experience.
   The focus of interview one will be to gain an understanding of what led the participant to their current role as an instructional technology leader. The purpose of this interview is to learn about their focused life history as it relates to the experiences that led them to their current role. This interview will last from 30 to 45 minutes.

2. Interview 2: The participant reconstructs details of the experience in the context in which it occurred. The focus of interview two will be to gain an account of the participant's detailed experience in their current role as an instructional technology leader at the onset of COVID-19 and during the school year. This interview will last from 30 to 45 minutes.

3. Interview 3: The participant reflects on the meaning of the experience. The focus of interview three will be for the participant to reflect on their experience of going through the COVID-19 pandemic in their role as an instructional technology leader in their school. The reflection of their experience will be based upon the participant situating themselves in the context of where they are now compared to where they were before (and how things are now compared to how things were before). The aim is to allow participants to make intellect and emotional connections between their work and life experiences as it relates to the impact of COVID-19 pandemic. This interview will last from 30 to 45 minutes.

   Follow-up Questions
   The researcher will implement follow-up questions as a safety protocol to establishing structure for the participant and the researcher alike during the interview.

RISKS
There is minimal risk involved with participating in this study. There is a possibility of feeling uncomfortable, apprehensive, or disturbed regarding specific questions that relate to professional practice. Please be aware that you may voluntarily withdraw from this study at any time, and all data collected will be instantly deleted or destroyed. If for any reason, you may feel negatively affected by this study, please contact the University of Southern Mississippi Institutional Review Board (IRB) at 228-865-4500 or irbhelp@usm.edu.

COMPENSATION/BENEFITS
Participants in this study will receive no direct compensation or benefits. Participants will not incur any monetary charges or fees to participate in this study. Participants are expected to allocate approximately 30-45 minutes of their time for each scheduled interview.

RIGHTS OF THE PARTICIPANTS
Participation in this study is strictly voluntary-based and any participant may voluntarily withdraw from this study at any time. Please be aware that has a participant, you have the

right to deny or refuse any question asked by the researcher, withdraw from this study, or withhold any artifacts or documents at any time. If a participant withdraws from this study, all data that have been collected with either be destroyed, deleted, or returned to the participant.

CONFIDENTIALITY

In accordance with all applicable regulations and laws for such data collection, all identifiable information shared with the researcher will be confidential and will remain confidential, unless an official request has been approved by the participant. This information may include location, school names, and individuals. Pseudonyms will be used to represent all participants, and groups of participants if appliable. No identifiable data will be used in any publications that will allow a reader to identify a participant. All artifacts, weblinks, and/or documents included to this study will remain in direct possession of the researcher. Locked filing cabinets and password-protected computers will be utilized in order to ensure protection and confidentiality of each participant. Individuals that are likely to review the data collected in detail include the researcher (Robin M. Jackson), the committee chair (Dr. Shuyan Wang), and dissertation committee members (Dr. Jon Beedle, Dr. Holly Foster, and Dr. Masha Krsmanovic). In the event the data is no longer deemed necessary to possess, it will be permanently destroyed or deleted. Please note that in the case of a detailed examination of the University of Southern Mississippi's Institutional Review Board (IRB), data provided to the researcher may be inspected or reviewed to ensure compliance and appropriate data analysis.

CONTACT INFORMATION

If you have questions about your participation in this study at any time, please contact the following:

Researcher:
Robin M. Jackson robin.jackson@usm.edu 601-408-6843

Dissertation Chair:
Dr. Shuyan Wang shuyan.wang@usm.edu 228-214-3264

If you have questions regarding your rights as a participant or a research-related injury, please contact:
USM IRB irbhelp@usm.edu 228-865-4500

SIGNATURE

Your signature below indicates that this informed consent document has been read and explained to you in its entirety. You have had a chance to ask questions and receive

clarification on any of the above sections. Your signature indicates that you have voluntarily agreed to participate in this study. You maintain the right to withdraw from this study at any point, even after signing this document. A copy of this consent form will be provided to you.

I, _____, consent to participate in

this study. (PARTICIPANT NAME)

_____

Participant Signature Date

APPENDIX B – Sample Email for School Superintendents

TITLE OF STUDY: The Lived Experiences of K-12 Instructional Technology Leaders During COVID-19

Researcher: Robin M. Jackson Protocol Number: 22-1622

Dear Sir/Madam:

My name is Robin Jackson and as part of satisfying the requirements for my dissertation, I am conducting a research study in the School of Leadership, College of Business and Economic Development at the University of Southern Mississippi (Gulf Park Campus). The purpose of this research study is to examine in-depth, the experiences of K-12 instructional technology leaders in Mississippi rural school districts by exploring the challenges faced, strategies employed, and lessons learned by instructional technology leaders during the period of COVID-19 pandemic when traditional classroom instruction was shifted to fully online instruction.

I am interested in the lived experiences of instructional technologists during COVID-19 as it relates to various elements of educational practice on student-centered learning and any barriers instructional technologists may have experienced during the COVID-19 pandemic. Additionally, I am interested in the lessons that were learned by instructional technologists as it relates to educational practices that align with the future readiness of their school.

I am requesting your help in recruiting participants for this phenomenological study. If you know of any instructional technologists that meet the following criteria, will you please forward my contact information, as well as the attached introductory letter, to them?

Criteria for this study:

1. have been employed in a K-12 school in southeast Mississippi from March 2020 to current.
2. employed in a K-12 school district for at least two years prior to the onset of COVID-19 pandemic.
3. work in a role to support student-teacher outcomes in the use of technology for teaching and learning at least two years prior to the onset of COVID-19 pandemic.
4. have a role as an instructional technologist, instructional technology designer, instructional technology director, or an academic coach.

You may also contact me directly to provide potential participants' names and contact information (phone number and/or email address). I appreciate your willingness to help and your consideration. Please let me know if you have any questions, comments, and/or concerns.

Sincerely,

Robin M. Jackson
Doctoral Candidate
School of Leadership
College of Business & Economic Development
University of Southern Mississippi (Gulf Park Campus)
601-408-6843 | Cell
Robin.Jackson@usm.edu | email

APPENDIX C – Sample Email for Participant Recruitment

TITLE OF STUDY: The Lived Experiences of K-12 Instructional Technology Leaders During COVID-19

Researcher: Robin M. Jackson Protocol Number: 22-1622

Dear Sir/Madam:

My name is Robin Jackson and as part of satisfying the requirements for my dissertation, I am conducting a research study in the School of Leadership, College of Business and Economic Development at the University of Southern Mississippi (Gulf Park Campus). The purpose of this research study is to examine in-depth, the experiences of K-12 instructional technology leaders in Mississippi rural school districts by exploring the challenges faced, strategies employed, and lessons learned by instructional technology leaders during the period of COVID-19 pandemic when traditional classroom instruction was shifted to fully online instruction.

I am interested in the lived experiences of instructional technologists during COVID-19 as it relates to various elements of educational practice on student-centered learning and any barriers instructional technologists may have experienced during the COVID-19 pandemic. Additionally, I am interested in the lessons that were learned by instructional technologists as it relates to educational practices that align with the future readiness of their school.

I am seeking K-12 instructional technologists, instructional technology designers, instructional technology directors, and/or an academic coaches that have been employed in their current their school district from at least March 2020 to current, employed at least two years in any K-12 school district in southeast Mississippi prior to the onset of COVID-19 pandemic, and work in a role to support student-teacher outcomes in the use of technology for teaching and learning at least two years prior to the onset of COVID-19 pandemic.

Participation includes three separate interviews, all of which are from 30 to 45 minutes and will be conducted via Zoom. Participation in this study will help colleges and universities gain greater insight into the experiences and successes with virtual platforms, teacher collaborations, and increase student engagement. I am specifically connecting the world of technological applications to shared leadership in the classrooms and the goal is to adapt and implement strategies that will suffice for the virtual platform, as well as for the traditional classroom setting, at any given moment. In short, I am seeking potential educational successes that instructional technologists had in their schools while using virtual platforms that we should continue to implement today.

Please know that your participation in this study is voluntary, and you may withdraw from this study at any time. All interviews and material gained through this process will remain confidential, and no names of individuals, school districts, colleges, and/or universities, or other indicators of identity will be used. If you are interested in participating in this phenomenological study, or have further questions concerning the study, please contact me directly at Robin.Jackson@usm.edu or by phone at 601-408-6843.

I appreciate your consideration and your time.

Robin M. Jackson
Doctoral Candidate
School of Leadership
College of Business & Economic Development
University of Southern Mississippi (Gulf Park Campus)
601-408-6843 | Cell
Robin.Jackson@usm.edu | email

APPENDIX D – Pre-Questionnaire

TITLE OF STUDY: The Lived Experiences of K-12 Instructional Technology Leaders During COVID-19

Researcher: Robin M. Jackson Protocol Number: 22-1622

Dear Sir/Madam:
The purpose of this pre-questionnaire is to evaluate if you meet the criteria to participate in the current research study that examines The Lived Experiences of K-12 Instructional Technology Leaders During COVID-19. Completion of the pre-questionnaire will take approximately 5 minutes. Information collected will include demographic data and information related to your role as an instructional technology leader. If you qualify, you will be contacted by the principal investigator to schedule one-on-one interviews.

The information collected will remain confidential and will only be used for the purpose of qualifying participants for the current study. If you have any questions, you may contact the principal investigator.

This study has been approved by IRB at the University of Southern Mississippi.

Principal Investigator:
Robin M. Jackson
PhD candidate of Instructional Technology and Design
School of Leadership
College of Business & Economic Development
University of Southern Mississippi (Gulf Park Campus)
601-408-6843 | Cell
Robin.Jackson@usm.edu | email

Dissertation Chair:
Dr. Shuyan Wang
shuyan.wang@usm.edu | email
228-214-3264 | phone

If you have questions regarding your rights as a participant or a research-related injury, please contact:
USM IRB
irbhelp@usm.edu | email
228-865-4500 | phone

Pre-Questionnaire

1. Did you work in a role to support student-teacher outcomes in the use of technology for teaching and learning at least two years prior to the onset of COVID-19 pandemic (before March 2018)?

   Yes _____
   No _____

2. Have you been employed in a rural K-12 school or school district for at least two years prior to the onset of COVID-19 pandemic (before March 2018)?

   Yes _____
   No _____

3. Did you work in a role to support student-teacher outcomes in the use of technology for teaching and learning during COVID-19 pandemic (March 2020 to current)?

   Yes _____
   No _____

4. Have you been employed in a rural K-12 school or school district in Mississippi during COVID-19 pandemic (March 2020 to current)?

   Yes _____
   No _____

5. What is your current job title for your role supporting student-teacher outcomes in the use of technology for teaching and learning? (e.g., instructional technologist, instructional technology designer, instructional technology director, academic coach, or other related title).

   _____

6. List the name of the school district that you currently work in?

   _____

7. How many years have you been in your current role?

---

8. How many years have you been working in Instructional Technology or Educational Technology?
9. What is your highest level of degree attained?
   Bachelor's degree
   Master's degree
   Professional degree
   Doctorate degree

10. Age:
    18-24 years old
    25-34 years old
    35-44 years old
    45-54 years old
    55-64 years old
    65-74 years old

    75 years or older

11. Ethnicity:
    White
    Hispanic or Latino
    Black or African American
    Native American or American Indian
    Asian / Pacific Islander
    Other

12. Gender:
    Male

    Female

    Trans-gender

    Non-binary

    Prefer not to answer

    Other_____

13. What is your desired pseudonym (this will be used in the interview transcription to maintain confidentiality of your identity)?

APPENDIX E – Semi-structured Interview Protocol

TITLE OF STUDY: The Lived Experiences of K-12 Instructional Technology Leaders During COVID-19

Researcher: Robin M. Jackson

Protocol Number: 22-1622

Interview One

- Q1: Tell me about the experiences that led you to your current role/job title. These experiences may include or be related to your family, school, and/or work experiences.

- Q2: Describe your day-to-day experiences in your role as ____ before COVID-19 and how that changed after COVID-19. Specifically, talk about your experiences as it relates to supporting teachers and students in the use of technology.

- Q3: Describe how the following were impacted during your experience supporting teachers and learners in the use of technology during COVID-19:
    - *Curriculum, instruction, and assessment* (e.g., designing instruction, using digital/adaptive technologies, using learner-centered pedagogy, assessing learners).
    - *Personalized professional learning* (e.g., engagement in professional learning communities, peer coaching, skill development opportunities).

    - *Robust infrastructure to support remote teaching and learning* (e.g., access to technology, internet, quality devices, etc.).
    - *Budget and resources* (e.g., financial funding).
    - *Community partnerships* (e.g., collaborations with community members and parents).
    - *Data and privacy* (e.g., protocols for academic integrity, data protection, security policies, etc.).
    - *Use of space and time* (e.g., flexible learning technologies, remote/virtual, equity and access).
    - *Collaborative leadership* (e.g., develop shared visions of innovative teaching and learning while leveraging technology, school district administration and leadership while encouraging them to approve, support, and embrace required technology resources).

- Q4: Describe specifically, some of the barriers that you encountered while supporting teachers and students in the use of technology during COVID-19.

- Q5: Given your account of experiences supporting teachers and learners using technology during COVID-19, what are some lessons or key takeaways that you learned from these experiences related to:
    - (a) Specific ways that you can support your school/district in the transition to digital learning.

- (b) Specific ways that you can support teachers with current and effective methods for providing instruction to students.

Interview Two

Interviewer: *In this interview, we are going to revisit the questions that were discussed in Interview One. The purpose of this will be mainly to discuss your responses and gain clarifications as needed. Also, you will have the opportunity to add any information that you feel will provide a more accurate account of your lived experiences.*

Q1: Tell me about the experiences that led you to your current role/job title. These experiences may include or be related to your family, school, and/or work experiences.

Q2: Describe your day-to-day experiences in your role as ____ before COVID-19 and how that changed after COVID-19. Specifically, talk about your experiences as it relates to supporting teachers and students in the use of technology.

Q3: Describe how the following were impacted during your experience supporting teachers and learners in the use of technology during COVID-19:

Curriculum, instruction, and assessment; Personalized professional learning; Robust infrastructure; Budget and resources; Community partnerships; Data and privacy; Use of space and time; and Collaborative leadership to support remote teaching and learning.

Q4: Describe specifically, some of the barriers that you encountered while supporting teachers and students in the use of technology during COVID-19.

Q5: Given your account of experiences supporting teachers and learners using technology during COVID-19, what are some lessons or key takeaways that you learned from these experiences related to:

(a) Specific ways that you can support your school/district in the transition to digital learning.

(b) Specific ways that you can support teachers with current and effective methods for providing instruction to students.

REFERENCES

Adedoyin, O. B. & Soykan, E. (2020): COVID-19 pandemic and online learning: the challenges and opportunities, Interactive Learning Environments. https://doi.org/10.1080/10494820.2020.1813180

Ahern, K. J. (1999). Ten Tips for Reflexive Bracketing. Qualitative Health Research, 9(3), 407–411. https://doi.org/10.1177/104973239900900309

Ali, T., Chandra, S., Cherukumilli, S., Fazlullah, A., Galicia, E., Hill, H., McAlpine, N., McBride, L., Vaduganathan, N., Weiss, D., Wu, M. (2021). Looking back, looking forward: What it will take to permanently close the K–12 digital divide. San Francisco, CA: Common Sense Media. https://www.commonsensemedia.org/sites/default/files/research/report/final_-_what_it_will_take_to_permanently_close_the_K-12_digital_divide_vfeb3.pdf

Alliance for Excellent Education, (2017). A guidebook for success: Strategies for implementing personalized learning in rural schools. Future Ready Schools. http://futureready.org

An, Y. & Mindrila, D. (2020). Strategies and tools used for learner-centered instruction. *International Journal of Technology in Education and Science (IJTES),* 4(*2*), 133-143.

Asamoah, M. K. (2021). ICT officials' opinion on deploying Open-Source Learning Management System for teaching and learning in universities in a developing society. *E-Learning and Digital Media*, *18*(1), 18–38. https://doi.org/10.1177/2042753020946280

Babbar, M. & Gupta, T. (2021). Response of educational institutions to COVID-19 pandemic: an inter-country comparison. *Policy Futures in Education, 20*(4): 469–491.

Barbour, M., Brown, R., Waters, L. H., Hoey, R., Hunt, J. L., Kennedy, K., Trimm, T. (2011). Online and blended learning: A survey of policy and practice from K-12 schools around the world. International Association for K-12 Online Learning. http://www.aurora-institute.org/wp-content/uploads/iNACOL_a-survey-of-policy-and-practice.pdf

Benalcázar, M. E., Barona, L., Valdivieso, Á. L., Vimos, V. H., Velastegui, D., & Santacruz, C. J. (2021). Educational Impact on Ecuadorian University Students Due to the COVID-19 Context. *Education Sciences*, *12*(1), 17. MDPI AG. http://dx.doi.org/10.3390/educsci12010017

Black, E., Ferdig, R., & Thompson, L. (2020). K-12 virtual schooling, COVID-19, and student success. *JAMA Pediatrics*. https://10.1001/jamapediatrics.2020.3800

Blanchard, M. R., LePrevost, C. E., Tolin, A. D., & Gutierrez, K. S. (2016). Investigating technology-enhanced teacher professional development in rural, high-poverty middle 101schools. *Educational Researcher, 45*(3), 207–220. https://doi.org/10.3102/0013189X16644602

Blitz, C.L. (2013). Can online learning communities achieve the goals of traditional professional learning communities? What the literature says. (REL 2013-003). Washington DC. U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, REL Mid-Atlantic. http://ies.ed.gov/nce/edlabs.

Borup, J., Jensen, M., Archambault, L., Short, C.R. & Graham, C.R. (2020). Supporting Students During COVID-19: Developing and Leveraging Academic Communities of Engagement in a Time of Crisis. *Journal of Technology and Teacher Education*, *28*(2), 161-169. Waynesville, NC USA: Society for Information Technology & Teacher Education. Retrieved March 23, 2021, from https://www.learntechlib.org/primary/p/216288/.

Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., Lambert, S., Al-Freih, M., Pete, J., Olcott, D. Jr, Rodes, V., Aranciaga, I., Bali, M., Alvarez, A. V., Jr., Roberts, J., Pazurek, A., Raffaghelli, J., Panagiotou, N., de Coëtlogon, P., Paskevicius, M. (2020). A global outlook to the interruption of education due to COVID-19 Pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, 15(1), 1– 126. https://doi.org/10.5281/zenodo.3878572

Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to Coronavirus pandemic. *Asian Journal of Distance Education*, 15(1), 2020. https://doi.org/10.5281/zenodo.3778083

Bryk, A. S., Sebring, P. B., Allensworth, E., Luppescu, S., & Easton, J. Q. (2015). Organizing schools for improvement: Lessons from Chicago. University of Chicago Press.

Carson, S. L., Gonzalez, C., Lopez, S., Morris, D., Mtume, N., Lucas-Wright, A., Vassar, S. D., Norris, K. C., & Brown, A. F. (2020). Reflections on the Importance of Community-Partnered Research Strategies for Health Equity in the Era of

COVID-19. *Journal of Health Care for the Poor and Underserved*, 31(*4*), 1515-1519.

Chandra, S., Fazlullah, A., Hill, H., Lynch, J., McBride, L., Weiss, D., Wu, M. (2020). Connect all students: How states and school districts can close the digital divide. San Francisco, CA: Common Sense Media. https://www.commonsensemedia.org/sites/default/files/featured-content/files/common_sense_media_partner_report_final.pdf

Cheek, D. (1997). Education about the History of Technology in K-12 Schools.

Cheng, X. (2020). Challenges of "School's Out, But Class's On" to School Education: Practical Exploration of Chinese Schools during the COVID-19 Pandemic. *Science Insights Education Frontiers*, *5*(2), 501-516.

Cheung, A. C., & Slavin, R. E. (2013). The effectiveness of educational technology applications for enhancing mathematics achievement in K-12 classrooms: A meta-analysis. Educational Research Review, 9,88-113.

Christensen, C., Johnson, C., & Horn, M. (2011). Disrupting class, expanded edition: How disruptive innovation will change the way the world learns. McGraw-Hill

Clark, D.B., Tanner-Smith, E.E., & Killingsworth, S. (2014). Digital Games, Design, and Learning: A Systematic Review and Meta-Analysis. SRI. http://www.sri.com/sites/default/files/publications/digital-games-design-and-learningbrief.pdf.

Clausen, J.M., Bunte, B. & Robertson, E.T. (2020). Professional Development to Improve Communication and Reduce the Homework Gap in Grades 7-12 during COVID-19 Transition to Remote Learning. *Journal of Technology and Teacher*

Education, *28*(2), 443-451. Waynesville, NC USA: Society for Information Technology & Teacher Education.

Colaizzi, P. F. (1978). Psychological research as the phenomenologist views it. In R. Vale & M. King (Eds.), Existential phenomenological alternatives for psychology (pp.48–71). New York, NY: Oxford University Press.

Corbeil, J. (2013). What do educational technologists do? The discipline as defined by educational technology. *Issues in Information Systems*, *14*(2), 336-245.

Creswell, J. (2013). Qualitative inquiry & research design: Choosing among five approaches (3rd ed.). Thousand Oaks, CA: Sage.

Creswell, J., Poth, C. (2016). Qualitative inquiry and research design: Choosing among five approaches (4th ed). SAGE Publications.

Crosby, S. D., Howell, P. B., & Thomas, S. (2020). Teaching through collective trauma in the era of COVID-19: Trauma-informed practices for middle level learners. *Middle Grades Review, 6*(2). https://scholarworks.uvm.edu/mgreview/vol6/iss2/5

Culp, K. M., Honey, M., & Mandinach, E. (2005). A Retrospective on Twenty Years of Education Technology Policy. Journal of Educational Computing Research, 32(3), 279–307. https://doi.org/10.2190/7W71-QVT2-PAP2-UDX7

Darling-Hammond, L., & Hyler, M. E. (2020). Preparing educators for the time of COVID and beyond. *European Journal of Teacher Education*, *43*(4), 457–465.

Davey, W. (2020). Zoom Gets Stuffed: Here's How Hackers Got Hold Of 500,000 Passwords. *Forbes*. https://www.forbes.com/sites/daveywinder/2020/04/28/zoom-gets-stuffed-heres-how-hackers-got-hold-of-500000-passwords/

De Brey, C., Snyder, T.D., Zhang, A., and Dillow, S.A. (2021). Digest of Education Statistics 2019 (NCES 2021-009). *National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education*. Washington, DC.

Delgado, A. J., Wardlow, L., McKnight, K., & O'Malley, K. (2015). Educational technology: A review of the integration, resources, and effectiveness of technology in K-12 classrooms. *Journal of Information Technology Education: Research, 14,* 397-416.

DeLuca, C., Bolden, B., Chan, J., (2017). Systematic professional learning through collaborative inquiry: Examining teachers' perspectives. *Teacher and Teacher Education*, (67): 67-78

Dibner KA, Schweingruber HA, Christakis DA. (2020). Reopening K-12 Schools During the COVID-19 Pandemic: A Report from the National Academies of Sciences, Engineering, and Medicine. *JAMA*;324(9):833–834

Digital Learning Collaborative (DLC). (2019). Snapshot 2019: A review of K-12 online, blended, and digital learning. Retrieved from https://www.digitallearningcollab.com

Dworkin, S.L. (2012). Sample Size Policy for Qualitative Studies Using In-Depth Interviews. *Arch Sex Behav* (41):1319–1320. https://doi.org/10.1007/s10508-012-0016-6

Ege University, Turkey, & Uslu, O. (2018). Factors associated with technology integration to improve instructional abilities: A path model. *Australian Journal of Teacher Education, 43*(4), 31–50. https://doi.org/10.14221/ajte.2018v43n4.3

Ensminger, D. C., & Surry, D. W. (2008). *Relative ranking of conditions that facilitate innovation implementation in the USA. Australasian Journal of Educational Technology, 24* (5). Retrieved from https://doi.org/10.14742/ajet.1194

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2013). Removing obstacles to the pedagogical changes required by Jonassen's vision of authentic technology-enabled learning. Computers & Education, 64, 175-182.

Farooq, F., Rathore, F.A., & Mansoor, S.N. (2020). Challenges of Online Medical Education in Pakistan During COVID-19 Pandemic. *Journal of the College of Physicians and Surgeons--Pakistan: JCPSP, 30 6*, 67-69.

Ferreira, M. C. (2020). COVID-19: Descriptive case study of a K–8 school district's abrupt transition to remote learning from a traditional in-person model.

Fiş Erümit. (2021). The distance education process in K-12 schools during the pandemic period: evaluation of implementations in Turkey from the student perspective. *Technology, Pedagogy and Education*, *30*(1), 75–94. https://doi.org/10.1080/1475939X.2020.1856178

Fishbane, L., & Tomer, A. (2020). As classes move online during COVID-19, what are disconnected students to do? Brookings. https://www.brookings.edu/articles/as-classes-move-online-during-COVID-19-what-are-disconnected-students-to-do/

Florida Virtual School. (2013). Florida Virtual School® 2013–14: The Nation's Premier Online Public School. Retrieved from https://www.flvs.net/areas/contactus/Documents/Florida_Virtual_School_Summary.pdf

Forrest County School District. (n.d). *All Schools*. https://www.fcsd.us/en-US/schools

Forrest County School District. (n.d.) *Digital Citizenship*. https://www.fcsd.us/en-US/digital-citizenship-3bcafa80

Francom, G.M., Lee, S.J. & Pinkney, H. (2021). Technologies, challenges and needs of K-12 teachers in the transition to distance learning during the COVID-19 pandemic. *TechTrends* 65, 589–601. https://doi.org/10.1007/s11528-021-00625-5

Future Ready Schools. (n.d.). *Future Ready Framework Definitions*. https://futureready.org/wpcontent/uploads/2016/07/FutureReadyFrameworkDefinitions.pdf

Gagne, R. M. (2013). Instructional technology: Foundations. Routledge.

Gamage, K. A. A., Silva, E. K. de, & Gunawardhana, N. (2020). Online Delivery and Assessment during COVID-19: Safeguarding Academic Integrity. *Education Sciences*, *10*(11), 301. MDPI AG. Retrieved from http://dx.doi.org/10.3390/educsci10110301

Gamrat, C., Zimmerman, H. T., Dudek, J., & Peck, K. (2014). Personalized workplace learning: An exploratory study on digital badging within a teacher professional development program. *British journal of educational technology*, 45(6), 1136-1148.

Gao, N., Hayes, J. (2022). The digital divide in education. Public Policy Institute of California.

Gipson, R. (2020). Rural families, no internet: Put Mississippi's best teachers, education plans on public TV. *Clarion Ledger*. https://www.clarionledger.com/story/opinion/2020/09/03/education-mississippi-broadcast-lessons-tv-internet-inadequate/5693878002/

Gray, L., Lewis, L. (2020). National Center for Education Statistics. (2020). Public-Use Data Files and Documentation (FRSS 109): 2018-19 Teachers' Use of Technology for School and Homework Assignments. https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2020088

Giri, S., & Dutta, P. (2021). Identifying Challenges and Opportunities in Teaching Chemistry Online in India amid COVID-19. *Journal of Chemical Education*, *98*(2), 694–699. https://doi.org/10.1021/acs.jchemed.0c00720

Hakim, B. (2020). Technology Integrated Online Classrooms and the Challenges Faced by the EFL Teachers in Saudi Arabia during the COVID-19 Pandemic. *International Journal of Applied Linguistics and English Literature, 9,* 33-39.

Hale, T., S. Webster, A. Petherick, T. Phillips, and B. Kira (2020). Oxford COVID-19 340 Government Response Tracker. *Blavatnik School of Governmen*t. Retrieved from: https://COVIDtracker.bsg.ox.ac.uk/

Haleem, A., Javaid, M., Mohd, A., Suman, R. (2022). Understanding the role of digital technologies in education: A review, Sustainable Operations and Computers. (3). Retrieved from: https://doi.org/10.1016/j.susoc.2022.05.004

Harris, B. (2019). Helping rural student thrive. *Mississippi had an impressive showing on the Nation's Report Card this year. But a new report says that drastic change is needed to help the state's rural students succeed.* https://hechingerreport.org/helping-rural-students-thrive/

Harris, S. (2008). ICT innovation transforming the heart of the classroom. SCIL.

Harris, S. (2020). Implementing Innovative Technology to Support K-12 Public School Learning During COVID-19. *UCLA*.

Hartshorne, R., Baumgartner, E., Kaplan-Rakowski, R., Mouza, C. & Ferdig, R.E. (2020). Special Issue Editorial: Preservice and Inservice Professional Development During the COVID-19 Pandemic. *Journal of Technology and Teacher Education, 28*(2), 137-147. Waynesville, NC USA: Society for Information Technology & Teacher Education. https://www.learntechlib.org/primary/p/216910/

Hattiesburg Public School District. (n.d.). *About Curriculum and Instruction*. https://www.hattiesburgpsd.com/apps/pages/index.jsp?uREC_ID=1353131&type=d&pREC_ID=1521220

HPSD Professional Learning Academy. (n.d.). *Scheduling and Booking Website*. https://hpsd.simplybook.me/v2/

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. EduCAUSE Review. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Huang, R., Tlili, A., Chang, T., Zhang, X., Nascimbeni, F., & Burgos, D. (2020). Disrupted classes, undisrupted learning during COVID-19 outbreak in China: application of open educational practices and resources. *Smart Learning Environments, 7*.

Hubers, D., Endedijk, D., & Van Veen, K. (2022) Effective characteristics of professional development programs for science and technology education. *Professional*

Development in Education, *48*(5) 827-846. Retrieved from: https://www.tandfonline.com/doi/full/10.1080/19415257.2020.1752289

Huck, C., & Zhang, J. (2021). Effects of the COVID-19 Pandemic on K-12 Education: A Systematic Literature Review. *New Waves-Educational Research and Development Journal*, *24*(1), 53-84.

Hung, D., Toh, Y., Jamaludin, A., & So, H.-J. (2017). Innovation becoming trajectories: Leveraging lateral and vertical moves for collaborative diffusion of twenty-first century learning practices. Asia Pacific Journal of Education, 37(4), 582–600. https://doi.org/10.1080/02188791.2017.1388213

Husserl. (1970). The crisis of European sciences and transcendental phenomenology; an introduction to phenomenological philosophy. Northwestern University Press.

International Center for Academic Integrity. Fundamental Values Project. (2014). Available online: https://www.academicintegrity.org/fundamental-values/

International Telecommunication Union. (2020). ITU Yearbook of Statistics 2019. ITU

International Taskforce on Teachers for Education (ITTE). (2020). *COVID-19 a global crisis for teaching and learning | Teachers Task Force for Education 2030*. https://teachertaskforce.org/knowledge-hub/COVID-19-global-crisis-teaching-and-learning

Jordan, K. (2020). COVID-19 School Closures in Low- and Middle-income Countries: Emergent Perspectives on the Role of Educational Technology. *Journal of Learning for Development*, *7*(3), 399-415. Retrieved from https://jl4d.org/index.php/ejl4d/article/view/433

Kara, N. & Cagiltay, K. (2017). In-service Preschool Teachers' Thoughts about Technology and Technology Use in Early Educational Settings. *Contemporary Educational Technology*, *8*(2), 119-141.

Karlin, M., Ottenbreit-Leftwich, A., Ozogul, G., & Liao, Y. (2018). K-12 technology leaders: Reported practices of technology professional development planning, implementation, and evaluation. Contemporary Issues in Technology and Teacher Education, *18*(4). https://citejournal.org/volume-18/issue-4-18/current-practice/K-12-technology-leaders-reported-practices-of-technology-professional-development-planning-implementation-and-evaluation

Kaup S., Jain R., Shivalli S., Pandey S. (2020). Sustaining academics during COVID-19 pandemic: The role of online teaching-learning. *Indian J Ophthalmology*. 68. 1220-1.

Kelum A.A. Gamage, Erandika K. de Silva, & Nanda Gunawardhana. (2020). Online Delivery and Assessment during COVID-19: Safeguarding Academic Integrity. *Education Sciences*, *10*(301), 301. https://doi.org/10.3390/educsci10110301

Kennedy, K., & Ferdig, R. E. (2018). *Handbook of research on K-12 online and blended learning* (2nd ed.). ETC Press. https://press.etc.cmu.edu/index.php/product/handbook-of-research-on-K-12-and-blending-learning-second-edition/

Kerres, M. Against All Odds: Education in Germany Coping with COVID-19. *Postdigit Sci Educ* 2, 690–694 (2020). https://doi.org/10.1007/s42438-020-00130-7

Khalil, M., Prinsloo, P., & Slade, S. (2018). User Consent in MOOCs Micro, Meso, and Macro Perspectives. International Review of Research in Open and Distributed Learning, 19(5). https://doi.org/10.19173/irrodl.v19i5.3908

Khayat, M., Hafezi, F., Asgari, P., & Talebzadeh Shoushtari, M. (2021). Comparison of the effectiveness of flipped classroom and traditional teaching method on the components of self-determination and class perception among university students. *Journal of advances in medical education & professionalism*, *9*(4), 230–237. https://doi.org/10.30476/JAMP.2021.89793.1385

Kong, S. C., Chan, T.-W., Huang, R., & Cheah, H. M. (2014). A review of e-learning policy in school education in Singapore, Hong Kong, Taiwan, and Beijing: Implications to future policy planning. Journal of Computers in Education, 1(2), 187–212. https://doi.org/10.1007/s40692-014-0011-0

Korkmaz, G. & Toraman, Ç. (2020). Are we ready for the post-COVID-19 educational practice? An investigation into what educators think as to online learning. *International Journal of Technology in Education and Science* (IJTES), 4(4), 293-309.

Kraft, Matthew A., Simon, N. S., & Lyon, M. A. (2020). Sustaining a sense of success: The importance of teacher working conditions during the COVID-19 pandemic. *EdWorkingPaper*. 20–279.

Lamar County School District. (n.d.). *Schools.* https://www.lamarcountyschools.org/?showHomepage=true#0

Lee, D., Huh, Y., Lin, C.-Y., & Reigeluth, C. M. (2022). Personalized Learning Practice in U.S. Learner-Centered Schools. *Contemporary Educational Technology, 14*(4), ep385.

Lee, N.T., (2020). Bridging digital divides between schools and communities. *Brookings.* https://www.brookings.edu/research/bridging-digital-divides-between-schools-and-communities/

Leech, N., Gullet, S., Cummings, M. H., & Haug, C. (2022). The challenges of remote K-12 education during the COVID-19 pandemic: Differences by grade level. Online Learning, 26(1), 245-267. DOI: 10.24059/olj.v26i1.2609

Lim, C. P., Zhao, Y., Tondeur, J., Chai, C. S., & Tsai, C. C. (2013). Bridging the gap: Technology trends and use of technology in schools. Journal of Educational Technology & Society, 16(2), 59-68. https://www.researchgate.net/publication/235747113

Liu, J. (2021). Bridging digital divide amidst educational change for socially inclusive learning during the COVID-19 pandemic. *Sage Open 11*(4).

Low, E., McIntyre, A., Burns, D., Zeichner, K., Sato, M., Hammerness, K., Campbell, C., Goodwin, A. L., Darling-Hammond, L. (2017). Empowered Educators: How High-Performing Systems Shape Teaching Quality Around the World. United Kingdom: Wiley.

Lowenthal, P., Borup, J., West, R. & Archambault, L. (2020). Thinking Beyond Zoom: Using Asynchronous Video to Maintain Connection and Engagement During the COVID-19 Pandemic. *Journal of Technology and Teacher Education, 28*(2), 383-391.

Malkus, N., Christensen, C., & West, L. (2020). School district responses to the COVID-19 pandemic: Round 1, districts' initial responses. *American Enterprise Institute.*

Manskar, N. (2020). Zoom will let users report 'Zoom bombing' straight from the app. *New York Post*. https://nypost.com/2020/04/22/zoom-to-let-users-report-zoom-bombing-straight-from-the-app/

Masterson, E., Chung, S., Shen, R., Singh, B., Savoia, E., & Rajabiun, S., (2023). Leveraging Community Resources and Local Expertise to Build a Safe Learning Environment for K-12 Students During COVID-19: A Field Experience. Journal of Public Health Management and Practice, 29(5), 735-744.

Mathewson, T. G., & Butrymowicz, S. (2020) Online programs used for coronavirus-era school promise results. The claims are misleading. USA Today. Retrieved from https://www.usatoday.com/story/news/education/2020/05/20/coronavirus-online-school-programs-learning-games/5218747002/

McLeod, S., Richardson, J. W., & Sauers, N. J. (2015). Leading technology-rich school districts: Advice from tech-savvy superintendents. Journal of Research on Leadership Education, 10(2), 104-126.

Means, B., Penuel, W. R., & Gallagher, D. J. (2017). Design of technology-enhanced learning: Integrating research and practice. Routledge.

Mete, A., Eunbae, L. (2018). Using Facebook groups to support social presence in online learning. *Distance Learning*, *39*(3), 334-352.

Mills, K. A., Rice, M., & Trifilo, J. (2017). Making the move to K-12 online teaching: Research on professional development. *In Handbook of research on K-12 online and blended learning* (pp. 394-418).

Mishra, P., & Koehler, M. J. (2020). Technological Pedagogical Content Knowledge (TPACK) in action: A descriptive study of secondary teachers' curriculum-based, technology-related instructional planning. Journal of Research on Technology in Education, 52(4), 408-419.

Mitchem, K., Wells, D.L. & Wells, J.G. (2003). Effective Integration of Instructional Technologies (IT): Evaluating Professional Development and Instructional Change. *Journal of Technology and Teacher Education, 11*(3), 397-414. Norfolk, VA: Society for Information Technology & Teacher Education.

Moore, R., Vitale, D., & Stawinoga, N. (2018). The digital divide and educational equity: A look at students with very limited access to electronic devices at home. *ACT Research & Center for Equity in Learning.*

Moustakas, C. (1994). Phenomenological research methods. Thousand Oaks, CA: Sage.

Mouza, C. (2020). Preparing teachers for technology integration: Moving from learning to design. Journal of Digital Learning in Teacher Education, 36(3), 134-137.

Mutekwe, E. (2012). The impact of technology on social change: A sociological perspective. Journal of Research in Peace, Gender and Development, 2(11), 226–238.

Nadelson, L., Seifert, A., & McKinney, M. (2014). Place Based STEM: Leveraging Local Resources to Engage K-12 Teachers in Teaching Integrated STEM and for Addressing the Local STEM Pipeline. *Proceedings of the ASEE Annual Conference & Exposition*, 1-21.

Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. Language Teaching Research, 19(2), 129–132. https://doi.org/10.1177/1362168815572747

National Center for Education Statistics. (NCES). (n.d.). *Search for Public School Districts* https://nces.ed.gov/ccd/districtsearch/index.asp

National Center for Education Statistics (NCES). (2021). Students' Access to the Internet and Digital Devices at Home. nces.ed.gov/blogs/nces/post/students-access-to-the-internet-and-digital-devices-athome

The National Commission on Excellence in Education. (1983). A Nation at Risk: The Imperative for Educational Reform. United States Department of Education.

NCATE (1997). Technology and the New Professional Teacher: Preparing for the 21st Century Classroom. National Council for Accreditation of Teacher Education. Retrieved from: http://ncate.org/accred/projects/tech/tech-21.html

NCH Software (n.d.) Express Scribe Transcription Software. Basic Edition. [Computer Software]. https://www.nch.com.au/components/scribemaci.zip

Nicosia, M. (2021). *Pandemic aid helps narrow Mississippi's digital divide*. EdTech: Focus on K-12. https://edtechmagazine.com/k12/article/2021/06/pandemic-aid-helps-narrow-mississippis-digital-divide

Noor, S., Isa, F., Mazhar, F. (2020). Online Teaching Practices During the COVID-19 Pandemic. *Education Process: International Journal*, *9*(3), 169–184. https://doi.org/10.22521/edupij.2020.93.4

Office of Technology Assessment. (1988). *Power on! New tools for teaching and learning* (OTA-SET-379). Washington, DC: U.S. Government Printing Office.

Retrieved from http://www.wws.princeton.edu/cgi-bin/byteserv.prl/~ota/disk2/1988/8831/8831.PDF

Office of Technology Assessment. (1992). Testing in American schools: Asking the right questions (OTA-SET-519). Washington, DC: U.S. Government Printing Office. Retrieved from http://www.wws.princeton.edu/cgi-bin/byteserv.prl/~ota/disk1/1992/9236/9236.PDF

Oliveira, G., Grenha Teixeira, J., Torres, A., & Morais, C. (2021). An exploratory study on the emergency remote education experience of higher education students and teachers during the COVID-19 pandemic. *British Journal of Educational Technology*, 52(4), 1357– 1376. https://doi.org/10.1111/bjet.13112

Olgren, C. (1997). Competition, Connection, Collaboration. Proceedings of the Annual Conference on Distance Teaching and Learning.

O'Shea, C. (2021). Distributed leadership and innovative teaching practices. International Journal of Educational Research Open, (2). Retrieved from https://doi.org/10.1016/j.ijedro.2021.100088

Peterson, L. R. (2015). Technology coaches: The heart of technology integration. Proceedings of the Society for Information Technology & Teacher Education International Conference (pp. 1392-1395). Waynesville, NC: Association for the Advancement of Computing in Education.

Philip, T. M. (2017). Learning with mobile technologies. *Communications of the ACM*, *60*(3), 34–36. https://doi.org/10.1145/2976735

Pike A., Pandey S., Goller C., Herzog J., Parks ST. (2022). Opportunities and Challenges of Online Instruction and Effective Pedagogy That Blurs the Lines between

Online and On-Site Teaching and Learning. *Journal of Microbiology & Biology Education*, *23*(1).

Pittman, J., Severino, L., DeCarlo-Tecce, M.J. and Kiosoglous, C. (2020), "An action research case study: Digital equity and educational inclusion during an emergent COVID-19 divide", *Journal for Multicultural Education*, 15(*1*) 68-84 https://doi.org/10.1108/JME-09-2020-0099

Plantin, J.-C., Lagoze, C., & Edwards, P. N. (2018). Re-integrating scholarly infrastructure: The ambiguous role of data sharing platforms. *Big Data & Society*, 5(1). https://doi.org/10.1177/2053951718756683

Polkinghorne, D. E. (1989). Phenomenological research methods. In R. S. Valle & S. Halling (Eds.), *Existential-phenomenological perspectives in psychology: Exploring the breadth of human experience* (pp. 41–60). Plenum Press.

Porter. (1993). Nursing research conventions: objectivity or obfuscation? *Journal of Advanced Nursing*, *18*(1), 137–143. https://doi.org/10.1046/j.1365-2648.1993.18010137.x

Powell, A., & Patrick, S. (2006). An international perspective of K–12 online learning: A summary of the 2006 NACOL international e-learning survey. North American Council for Online Learning. https://files.eric.ed.gov/fulltext/ ED514433.pdf

Prinsloo, P., Slade, S. & Khalil, M. (2019) Student data and privacy in MOOCs: a sentiment analysis, Distance Education, 40:3, 395-413.

Project Red. (n.a.). "How Two Districts Are Using Technology to Improve Outcomes and Cut Costs: Models for Success From Project Red," http://www.ednetinsight.com/news-alerts/marketinsights/two_districts.html.

Quezada, R.L., Talbot, C., Quezada-Parker, K.B., (2020): From bricks and mortar to remote teaching: a teacher education programme‘s response to COVID-19, *Journal of Education for Teaching.* Retrieved from http://www.doi.org/10.1080/02607476.2020.1801330

Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online university teaching during and after the COVID-19 Crisis: Refocusing teacher presence and learning activity. *Post-digital Science and Education*, 2(3), 923– 945. https://doi.org/10.1007/s42438-020-00155-y

Rashid, T., Asghar, H. (2016). Technology use, self-directed learning, student engagement and academic performance: Examining the interrelations. *Computers in Human Behavior*, 63, 604-612. https://doi.org/10.1016/j.chb.2016.05.084.

Reeves, T. C., & Lin, L. (2020). The research we have is not the research we need. *Educational technology research and development: ETR & D*, 1–11. Advance online publication. https://doi.org/10.1007/s11423-020-09811-3

Reich, J., Buttimer, C. J., Fang, A., Hillaire, G., Hirsch, K., Larke, L. R., Slama, R. (2020). Remote learning guidance from state education agencies during the COVID-19 pandemic: *A First Look.* https://doi.org/10.35542/osf.io/437e2

Reimers, F., Saavedra, J., Schleicher, A., Tuominen, S. (2020). Supporting the continuation of teaching and learning during the COVID-19 Pandemic. Retrieved from http://www.oecd.org

Ribeiro, R. (2020). How university faculty embraced the remote learning shift. EdTech Magazine. https:// edtechmagazine.com/higher/article/2020/04/how-university-faculty-embraced-remote-learning-shift

Richardson, J.W., Hollis, E., Pritchard, M., & Lingat, J.E.M. (2020). Shifting teaching and learning in online learning spaces: An investigation of a faculty online teaching and learning initiative. *Online Learning 24(1)*, 67-91.

Richardson, J. W., & McLeod, S. (2011). Technology leadership in Native American schools. Journal of Research in Rural Education (Online), 26(7), 1.

Richardson, J. W., & Sterrett, W. L. (2018). District technology leadership then and now: A comparative study of district technology leadership from 2001 to 2014. *Educational Administration Quarterly, 54*(4), 589–616. https://doi.org/10.1177/0013161X18769046

Rivero, V. (2018). 2017-2018: The minds behind what's now & what's next. EDTech Digest.

Royals, K. (2020, October 1.) Mississippi is getting devices to every child. That's just the first step. *Mississippi Today.* Retrieved from https://mississippitoday.org/2020/10/01/mississippi-is-getting-devices-to-every-child-thats-just-the-first-step/

Royals, K. (2021, October 8.) Schools, state slowly spending federal COVID-19 money. *Mississippi Today*. Retrieved from https://mississippitoday.org/2021/10/08/schools-state-slowly-spending-federal-COVID-19-money/

Seidman, I. (2013) Interviewing as Qualitative Research A Guide for Researchers in Education and the Social Sciences. Teachers College Press, New York.

Simmons, D. (2022). Lessons from COVID-19: Four Reasons School Communities Should Embrace K-12 Online Learning. *Journal of Online Learning Research,*

8(2), 235-258. Waynesville, NC USA: Association for the Advancement of Computing in Education (AACE). Retrieved from https://www.learntechlib.org/primary/p/219534/

Simsek, N. (2005). Perceptions and Opinions of Educational Technologists Related to Educational Technology. Educational Technology & Society, 8 (4), 178-190.

Shamir-Inbal, T. & Blau, I. (2021). Facilitating emergency remote K-12 teaching in computing-enhanced virtual learning environments during COVID-19 pandemic - blessing or curse? *Journal of Educational Computing Research 59*(7): 1243–1271.

Sharma, S., & Bumb, A. (2021). The Challenges Faced in Technology-Driven Classes During COVID-19. *International Journal of Distance Education Technologies (IJDET), 19*(1), 66-88.

Showalter, D., Hartman, S.L., Johnson, J., & Klein, B. (2019). Why rural matters: The time is now. Washington, D.C: Rural School and Community Trust. Available at http://www.ruraledu.org/WhyRuralMatters.pdf

Soares, R., Mello, M.C., Silva, C.M., Machado, W., & Arbilla, G. (2020). Online Chemistry Education Challenges for Rio de Janeiro Students during the COVID-19 Pandemic. *Journal of Chemical Education, 97,* 3396-3399.

Stanhope, D. S., & Corn, J. O. (2014). Acquiring teacher commitment to 1:1 initiatives: The role of the technology facilitator. Journal of Research on Technology in Education, 46(3), 252-276.

Starks, H., & Trinidad, S. B. (2007). Choose your method: A comparison of phenomenology, discourse analysis, and grounded theory. *Qualitative Health Research, 17*(10), 1372-1380.

Sterrett, W., & Richardson, J. (2020). Supporting Professional Development Through Digital Principal Leadership. *Journal of Organizational & Educational Leadership*. *5*(2), 4.

Sugar, W., & Holloman, H. (2009). Technology leaders wanted: Acknowledging the leadership role of a technology coordinator. TechTrends, 53(6), 66.

Sugar, W., & van Tryon, P. J. S. (2014). Development of a virtual technology coach to support technology integration for K-12 educators. TechTrends, 58(3), 54-62.

Supovitz, J. & D'Auria, J. (2020). Leading Improvement in challenging times guide.

Thompson, K. M., & Copeland, C. (2020). Inclusive considerations for optimal online learning in times of disasters and crises. *Information and Learning Science*, 121(7), 481– 486. https://doi.org/10.1108/ILS-04-2020-0083

Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Educational Technology Research and Development, 65(3), 555–575.* Retrieved from https://doi.org/10.1007/s11423-016-9481-2

Tull, S., Dabner, N., & Ayebi-Arthur, K. (2017). Social media and e-learning in response to seismic events: Resilient practices. *Journal of Open Flexible and Distance Learning, 21*(1), 63–76.

Tyler-Wood, T.L., Cockerham, D. & Johnson, K.R. Implementing new technologies in a middle school curriculum: a rural perspective. *Smart Learn. Environ.* 5, 22 (2018). Retrieved from https://doi.org/10.1186/s40561-018-0073-y

UNESCO. (2020). 290 Million Students Out of School Due to COVID-19: UNESCO Releases First Global Numbers and Mobilizes Response. Retrieved from: https://en.unesco.org/news/290-million-students-out- school-due-COVID-19-unesco-releases-first-global-numbers-and-mobilizes

UNESCO. (2020). Startling disparities in digital learning emerge as COVID-19 spreads: UN education agency. Retrieved from https://news.un.org/en/story/2020/04/1062232

UNESCO. (2021). Global Education Coalition. COVID-19 Education Response. https://en.unesco.org/covid19/educationresponse/globalcoalition

U.S. Department of Education. (2014). Future Ready Schools: Building Technology Infrastructure for Learning. Office of Educational Technology. https://tech.ed.gov/wp-content/uploads/2014/11/Future-Ready-Schools-Building-Technology-Infrastructure-for-Learning-.pdf

U.S. Department of Education (2000). e-Learning: Putting a World-Class Education at the Fingertips of All Children. National Educational Technology Plan. Washington, D.C. Retrieved from: https://files.eric.ed.gov/fulltext/ED444604.pdf

U.S. Department of Education (2004). Toward A New Golden Age in American Education—How the Internet, the Law and Today's Students Are Revolutionizing Expectations. National Educational Technology Plan. Washington, D.C. Retrieved from: http://files.eric.ed.gov/fulltext/ED484046.pdf

U.S. Department of Education (1996). Getting America's Students Ready for the 21st Century: Meeting the Technology Literacy Challenge. National Education Technology Plan. Washington, D.C. Retrieved from: https://ed.gov/Technology/Plan/NatTechPlan

U.S. Department of Education, Office of Educational Technology. (2010). Transforming American Education: Learning Powered by Technology. National Educational Technology Plan. Washington, D.C. Retrieved from: https://files.eric.ed.gov/fulltext/ED444604.pdf

U.S. Department of Education, Office of Educational Technology. (2016). Future Ready Learning: Reimagining the role of technology in education. National Education Technology Plan. Washington, D.C. Retrieved from: https://tech.ed.gov/files/2015/12/NETP16.pdf

U.S. Department of Education, Office of Educational Technology. (2017). Reimagining the role of technology in education: 2017 national education technology plan update. National Education Technology Plan. Washington, D.C. Retrieved from: https://tech.ed.gov/files/2017/01/NETP17.pdf

U.S. Department of Education, Office of Elementary and Secondary Education. (2022). American Rescue Plan. Washington, D.C. Retrieved from: https://oese.ed.gov/offices/american-rescue-plan/

Van Manen. (1990). Researching lived experience: human science for an action sensitive pedagogy. State University of New York Press.

Veluvali, P., & Surisetti, J. (2022). Learning Management System for Greater Learner Engagement in Higher Education—A Review. Higher Education for the Future, 9(1), 107-121. https://doi.org/10.1177/23476311211049855

Voogt, J., Fisser, P., Pareja Roblin, N., Tondeur, J., & van Braak, J. (2018). Technological pedagogical content knowledge—a review of the literature. Journal of Computer Assisted Learning, 29(2), 109-121.

Warschauer, M.; Zheng, B.; Niiya, M.; Cotten, S.; Farkas, G. (2014). Balancing the One-to-One Equation: Equity and Access in Three Laptop Programs. *Equity & Excellence in Education, 47*(1), 46-62.

Waterford UPSTART. (2018). How two-way communication can boost parent engagement. https://www.waterford.org/education/two-way-communication-parent-engagement/

Watson, J., and Murin, A., (2012). Blended Learning in Rural Colorado: Status and Strategies for Expansion. Retrieved from http://www.cde.state.co.us/sites/default/files/documents/onlinelearning/download/ruralblendedlearning_evergreen.pdf.

Watson, J., Murin, A., Vashaw, L., Gemin, R., Rapp, C. (2013). Keeping Pace with K-12 On-line and Blended Learning: A Guide to Policy and Practice. Retrieved from http://kpk12.com/reports/.

Webb, C.L., Kohler, K.L. & Piper, R.E. (2021). Teachers' Preparedness and Professional Learning about Using Educational Technologies During the COVID-19 Pandemic. *Journal of Online Learning Research, 7*(2), 113-132. Waynesville, NC USA: Association for the Advancement of Computing in Education (AACE).

Westera, W. (2004). On strategies of educational innovation: Between substitution and transformation. Higher Education, *47*(4), 501–517. Retrieved from https://doi.org/10.1023/B:HIGH.0000020875.72943.a7

Wharton-Beck, A., Chou, C. C., Gilbert, C., Johnson, B., & Beck, M. A. (2022). K-12 school leadership perspectives from the COVID-19 pandemic. Policy Futures in Education, 0(0). https://doi.org/10.1177/14782103221135620

Williamson, B. (2020). New pandemic edtech power networks. Code Acts in Education blog. https://codeactsineducation.wordpress.com/2020/04/01/new-pandemic-edtech-power-networks/

Wirihana L, Welch A, Williamson M, Christensen M, Bakon S, Craft J. Using Colaizzi's method of data analysis to explore the experiences of nurse academics teaching on satellite campuses. Nurse Res. 2018 Mar 16;25(4):30-34. https://doi:10.7748/nr.2018.e1516

Wojnar, D. M. (2007). Phenomenology: An Exploration. *Journal of Holistic Nursing*, *25*(3), 172–180.

Wong, E. M., & Li, S. C. (2006). Is ICT a lever for educational change? A study of the impact of ICT implementation on teaching and learning in Hong Kong. Informatics in Education, 5(2), 329–348. https://doi.org/10.15388/infedu.2006.23

Wright, A. (2020, October 14.) The new normal: How Mississippi students are adjusting to a virtual school year. Retrieved from https://mississippitoday.org/2020/10/14/how-mississippi-students-are-adjusting-to-a-virtual-school-year/

Wright, C. (2022). Mississippi State Board of Education: Strategic Plan Annual Progress Report.https://www.mdek12.org/sites/default/files/Offices/MDE/OCGR/2022_strategic_plan_annual_sbe_report.pdf

Wu, D. (2014). An introduction to ICT in education in China. In R. Huang, Kinshuk, & J. Price (Eds.), ICT in education in global context: Emerging trends report 2013–2014 (pp. 65–84). Springer.

Xiangling Z., Ahmed T., Ronghuai H., Tingwen C., Daniel B., Junfeng Y., & Jiacai Z. (2020). A Case Study of Applying Open Educational Practices in Higher Education during COVID-19: Impacts on Learning Motivation and Perceptions. Sustainability (Basel, Switzerland), 12(9129), 9129.

Yu, C., & Prince, D. L. (2016). Aspiring school administrators' perceived ability to meet technology standards and technological needs for professional development. Journal of Research on Technology in Education, 48(4), 239-257.

Zhang W. (2022). The Role of Technology-Based Education and Teacher Professional Development in English as a Foreign Language Classes. *Frontiers in psychology*, *13*, 910315. https://doi.org/10.3389/fpsyg.2022.910315

Zheng, Y., & Smaldino, S. (2020). Teaching and learning at a distance: Foundations of distance education. Routledge.