5-2021

Leading at the Speed of Learning: Superintendent Leadership of P-12 Technology During the COVID-19 Pandemic

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Abstract

COVID-19 significantly disrupted education in districts across New York State, forcing school administrators and stakeholders to respond to an unpredictable pattern of lockdowns and restrictions. As a result of the lockdowns, school districts transitioned to remote learning and a reliance upon digital learning technologies. Previous research has indicated numerous challenges superintendents face in implementing technology such as resistance to change or lack of adequate resources. With the onset of the pandemic and the transition to online learning, the luxury of implementing programs such as one-to-one computing became necessity. The goal of this study was to better understand how the application of superintendent leadership in implementing P-12 technology was perceived as a result of the pandemic. Additional research is recommended to better understand how technological solutions implemented during COVID-19 will shape the future P-12 classrooms. The purpose of this qualitative descriptive study was to describe how seven upstate New York superintendents' leadership in technology implementation was approached and applied in P-12 school districts during the COVID-19 crisis. Their perceptions regarding crisis recovery, disruptive change, and their concept of the new-normal, post-COVID-19 were explored within the context of P-12 technology implementation. The findings from this qualitative descriptive study suggest that each of the participant superintendents noted a shift in priorities, focus and application of leadership in response to the pandemic. Specifically, superintendents describe factors such as changing mindsets and allaying fear by developing and facilitating interpersonal relationships through the empowerment of key technology skilled and trusted stakeholders; building technology capacity to ensure digital equity and access, and facilitating, leading and further developing communication with stakeholders in order to share information, strategy and/or vision. Recommendations and implications gathered from open-ended inquiry, center around the development of P-12 technology leadership development, visioning for future implementation and preparedness, and the application of leadership from a multi-framed approach.

Document Type

Dissertation

Degree Name

Doctor of Education (EdD)

Department

Executive Leadership

First Supervisor

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Second Supervisor

Luvelle Brown, Ed.D.

Subject Categories

Education

Leading at the Speed of Learning:

Superintendent Leadership of P-12 Technology During the COVID-19 Pandemic

By

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Submitted in partial fulfillment

of the requirements for the degree

Ed.D. in Executive Leadership

Supervised by

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St. John Fisher College

May 2021

Dedication

Thank you to my committee chair, Dr. Theresa Pulos, and committee member Dr. Luvelle Brown, for their patience, support and guidance throughout the process. I am dedicating this dissertation in memory of my father, Frank Lisi; my wife, Lori Lisi; my mother, Sally Lisi; and my two boys, Dominick and Anthony. In ways unique to each, they provided the support and encouragement needed to follow this journey.

Biographical Sketch

Dominick J. Lisi is currently the Chief of Operations and Innovation at the Fulton City School District. Mr. Lisi attended the State University of New York at Cortland and graduated with a Bachelor of Science degree in Psychology in 2001. He attended Le Moyne College and graduated with a Master of Science degree in Teaching in 2005, further earning New York State School District Leadership credentials in 2020. He came to St. John Fisher College in the summer of 2018 and began doctoral studies in the Ed.D. Program in Executive Leadership. Mr. Lisi pursued his research in Leading at the Speed of Learning: Superintendent Leadership of P-12 Technology During the COVID-19 Pandemic, under the direction of Dr. Theresa L. Pulos and Dr. Luvelle Brown and received the Ed.D. degree in 2021.

Abstract

COVID-19 significantly disrupted education in districts across New York State, forcing school administrators and stakeholders to respond to an unpredictable pattern of lockdowns and restrictions. As a result of the lockdowns, school districts transitioned to remote learning and a reliance upon digital learning technologies. Previous research has indicated numerous challenges superintendents face in implementing technology such as resistance to change or lack of adequate resources. With the onset of the pandemic and the transition to online learning, the luxury of implementing programs such as one-to-one computing became necessity. The goal of this study was to better understand how the application of superintendent leadership in implementing P-12 technology was perceived as a result of the pandemic. Additional research is recommended to better understand how technological solutions implemented during COVID-19 will shape the future P-12 classrooms. The purpose of this qualitative descriptive study was to describe how seven upstate New York superintendents' leadership in technology implementation was approached and applied in P-12 school districts during the COVID-19 crisis. Their perceptions regarding crisis recovery, disruptive change, and their concept of the new-normal, post-COVID-19 were explored within the context of P-12 technology implementation. The findings from this qualitative descriptive study suggest that each of the participant superintendents noted a shift in priorities, focus and application of leadership in response to the pandemic. Specifically, superintendents describe factors such as changing mindsets and allaying fear by developing and facilitating interpersonal

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Chapter 1: Introduction

On March 16, 2020, Governor of New York Andrew Cuomo signed Executive Order No. 202.4, directing all schools in the state to close in-person instruction by March 18, 2020, in response to the COVID-19 threat. School district leaders across the state, as a result, were challenged to develop plans that continued to provide instruction to students through alternative means. School district superintendents have a particular set of leadership qualities or attributes to facilitate technology implementation during a crisis. Although school districts have introduced technology in the classroom for the past several decades, the sudden shift to remote instruction, promulgated by the COVID-19 closures, is unprecedented and challenges district leaders and superintendents to revisit leadership in the context of crisis innovation and implementation.

Since the introduction of the No Child Left Behind Act ([NCLB], 2002), instructional technology in P-12 education has increased significantly. State and federal funding resources have fueled the increase in instructional technology use, as have private-sector employers (Heinrich et al., 2019). The challenges associated with the introduction of district-wide technologies present district superintendents with a multitude of complex challenges that require highly effective leadership skills as well as a working knowledge of technology, organizational culture, professional development, finance, curriculum, instruction, and various other related skills (McLeod et al., 2014; Medina et al., 2018).

The COVID-19 crisis adds urgency to what has already been described in the literature as a comprehensive list of challenges superintendents face when implementing P-12 technology. Applying leadership during the pandemic poses challenges associated with ensuring equity and access to technology, providing professional learning opportunities in support of remote learning, learning and modeling technology innovations in communication and leadership, and navigating unchartered territory regarding leading both synchronous and asynchronous learning environments (Netolicky, 2020; Richardson & Sterrett, 2019).

Prior to the onset of the COVID-19 pandemic, the most prolific, costly, and controversial classroom technology trend adopted by many educational leaders was the one-to-one student mobile device program (Harris & Al-Bataineh, 2015). Given that the COVID-19 pandemic requires school districts to provide online remote instruction, one-to-one device programs and ensuring access to the internet are essential in the facilitation and continuation of learning. Lessons learned from previous implementations can assist district leaders in applying leadership skills during the process, and they can serve to inform policy and practice. Additionally, a review of crisis innovation may shed light on the acceleration and transition from technology-supported instruction to technology-reliant learning (Gross & Sampat, 2020).

Considering the complexities associated with leading large-scale technology implementations in P-12 education—from determining effectiveness of instructional technology to ensuring the overall success of such programs—school district leaders must be prepared to overcome such challenges to improve their student's learning experience (Sheppard & Brown, 2014). Despite the inconclusive research regarding the

effectiveness of instructional technology to improve student learning, studies generally show the importance of leadership in the overall outcome of such programs (Levin & Schrum, 2012).

Davies's (2010) extended model of educational technology leadership suggests that leadership serves as a link between all internal influencing factors, such as the overall vision of the organization and stakeholder engagement, as well as external influencing factors such as teaching, learning, policy, and advances in technology. Leadership serves to facilitate collaborations among the various stakeholder groups within an organization to help develop common ground and navigate through complex personal, organizational, social, political, and economic intricacies (Davies, 2010).

While the existing limited research supports the influence superintendents have in successful technology implementation at the P-12 level (Richardson et al., 2015), lack of leadership can result in costly and failed implementations, as in the case of both the Liverpool Central School District laptop program (Johnson, 2008) and the Los Angeles one-to-one initiative (Lamb & Weiner, 2018). In each case, the leadership failed to build a foundation supported by research-based standards and practice (International Society for Technology in Education [ISTE], 2021; Johnson, 2008; Lamb et al., 2018; National Policy Board for Educational Administration [NPBEA], 2015).

McLeod et al. (2014) noted that a wealth of research exists, aside from leading technology, that indicates the imperative role superintendents play in the overall success of their associated school districts. The meta-analyses of Marzano and Waters (2009) and the research compilations by Bjork and Kowalski (2005) and Glass et al. (2000) suggest that, in all cases, the decisions and leadership provided by the district superintendents

resulted in a positive relationship between district leadership and student performance. Specifically, leadership attributes that correlated most with student performance were associated with collaborative goal setting, achievement and instruction, stakeholder goal alignment, accountability, and resource management (Waters & Marzano, 2006). In spite of the available research and the overwhelming evidence supporting superintendents' influence, very few studies focus on their ability, acumen, or preparation in leading technology (McLeod et al., 2014).

Bolman and Deal's (2017) four-frame model served as the conceptual framework for developing this study's interview questions and in analyzing the participants' responses regarding how upstate New York P-12 superintendents applied leadership when implementing technology both before and concurrently with the pandemic. The four-frames model is woven throughout the literature, and it is often utilized as a lens to attribute meaning and derive understanding of organizational structure and leadership.

Problem Statement

Technology is a disruptive change agent as it can transform the nature of pedagogy and provide improved ways to support learners (Pérez-Sanagustín et al., 2017). Yet, the process of leading technology implementation is complex and involves the adaptation of specific leadership styles in response to organizational culture, external factors, and personal attributes (Fullan, 2003). When superintendent leadership is perceived as effective, the immersive and impactful use of technology, such as multimedia and software use, can play an integral role in the learning process (Pérez-Sanagustín et al., 2017; Taleb & Hassanzadeh, 2015). Conversely, when the leadership

fails to adapt or provide essential supports at the very top of the organizational structure, such implementations can fail (Johnson, 2008).

Successful technology integration often requires and results in a pedagogical, methodological, and organizational shift that is precipitated, facilitated, and associated through stakeholder support, buy-in, and commitment (Avidov-Ungar, 2018). Additionally, superintendents with technology leadership that is associated with risk-taking and is characterized as collaborative and visionary were those most associated with successful technology implementation (Richardson et al., 2015). However, if their leadership is lacking in providing support, assistance, instruction, and encouragement, technology integration can still fail (Vella et al., 2017). Bolman and Deal's (2017) four-frame model provides a lens for examining how superintendents can adapt to both the internal and external needs associated with district-wide implementation and offer insight and perspective in leading complex organizations such as in the case with public school districts. The intersection of applying superintendent leadership toward the implementation of P-12 technology and the introduction of COVID-19 presents an unprecedented challenge as the latter introduces a new and previously unresearched variable.

Theoretical Rationale

This study is guided by Bolman and Deal's (2017) four frames of leadership model. The four-frames model offers a lens through which the perceived application of leadership by upstate New York P-12 public school district superintendents in implementing technology before and concurrently with the COVID-19 can be viewed.

The four-frames model was developed to make sense of organizations by creating a lens to view and understand their structures.

The four-frames model allows researchers to view organizational structure and leadership from various perspectives, and the model helps in understanding the complexities associated with the distinct qualities and convergent complexities inherent in both social science and leadership practice and research (Bolman & Deal, 2003). The four frames are (a) the structural frame, is described in terms of order, goals, hierarchical structure, and accountability; (b) the human resource frame, is focused on the needs of an organizations' people, their feelings, input, and desires; (c) the symbolic frame, focused on an organization's stories, myths, imagery, and culture; and (d) the political frame, generally described in research as the "jungle." The political frame is characterized by the existence of coalitions, power struggles, competing interests, and conflict (Bolman & Deal, 2006). The findings of this study are discussed and interpreted through these frames.

Statement of Purpose

The purpose of this qualitative descriptive study was to show how upstate New York superintendents' leadership in technology implementation was approached and applied in P-12 school districts during the COVID-19 crisis. Their perceptions regarding crisis recovery, disruptive change, and their concept of the new-normal, post-COVID-19 era, was also explored within the context of P-12 technology implementation. Leadership in technology implementation for this study is defined as the application of leadership skills in providing instructional technology resources to all students.

Research Questions

The following research questions guided the development and execution of this study:

1. How do school district superintendents believe or perceive they are applying leadership practices while implementing district-wide technology?
2. In consideration of their perception of leadership, how have school district superintendents' practices or methodologies changed in response to the COVID-19 crisis within the context of technology implementation?

Significance of the Study

The potential significance of this study is understanding how superintendent leadership practices are applied through technology initiatives, which may serve to help further the understanding of the disparity between implementations identified as successful and those deemed as failures (Johnson, 2008; Greaves et al., 2010). Given that successful implementation increases student engagement and motivation, and in some notable cases, improves student outcomes (Francis, 2017; Harper & Milman, 2016), the knowledge of how superintendents apply such practices could assist in the development of academic programs informing leadership practice (McLeod et al., 2015; Schrum & Levin, 2015).

Limited research exists regarding the role superintendents play in leading P-12 technology implementation with no studies noting the COVID-19 pandemic as an added variable (Anderson & Dexter, 2005; Richardson et al., 2015; Schrum & Levin, 2009). COVID-19 introduced a new context that lacks historical precedence and relevant research thus adding to a very limited or unavailable body of research. When the element

of a crisis such as a pandemic is introduced, the significance of the research is extended to such considerations as urgency and the transformational nature of crisis innovation (Doucet et al., 2020; Johnson & Murray, 2021). As Netolicky (2020) pointed out, school districts and school district leaders will need to contend with what is described as the "new normal," which may be the residual effects of consistent online synchronous and asynchronous learning. Additionally, superintendents' perceptions of their application of technology leadership during the COVID-19 crisis will help to inform future post-COVID-19 technology implementations, as the data may help in understanding leadership during rapid reform out of necessity, compared to deliberate, thoughtful, and methodical planning (Netolicky, 2020).

Definitions of Terms

The following definitions informed this study:

Digital natives – individuals born after 1995 were born into an age that is both characterized and defined by information and communications technology (ICT). Digital natives are described as active, experiential learners, multitaskers, and dependent upon technology to access information and communication (Couldry & Hepp, 2018).

Instructional technology – where computers were intentionally integrated into schools and students' structured learning experiences to be used as a pedagogical tool (Jackson et al., 2015).

School district superintendent – individuals who design and nurture the needed conditions for better instructional, curricular, and assessment circumstances. They are the driving force behind student learning as well as positive outcomes (Edwards, 2017). The school district superintendent's role is multifaceted, complex, and requires a wide variety

of skill sets (Edwards, 2017). It is a one-of-a-kind job, and it is one of the most significant roles in a district given that the school superintendent is the primary instructional leader within a school district (Edwards, 2017).

Smart school – an educational establishment that implements instructional processes and management practices that promote systemic changes that are intended to assist learners to overcome challenges posed by the ICT era. These schools have been systemically reinvented regarding teaching practice, learning practice, and school management, and they continue to evolve. Smart schools seek to make learning more motivating, interesting, stimulating, as well as meaningful through an appropriate mix of learning strategies (Taleb & Hassanzadeh, 2015).

COVID-19 – the abbreviation for "coronavirus disease 2019," which is part of a family of infectious viruses that result in a respiratory illness that can be life threatening to humans. COVID-19 was declared a pandemic by the World Health Organization in March of 2020, and it has resulted in the death of over 2 million throughout the world (Katella, 2020).

Chapter Summary

The problem explored by this study is the lack of a comprehensive technology implementation leadership model or associated professional learning program for school superintendents (Johnston, 2015; Thornton, 2017; Vella et al., 2017). The purpose of this qualitative descriptive study was to describe how seven upstate New York P-12 public school superintendents approached and applied technology implementation prior to and concurrently with the COVID-19 pandemic. Their perceptions regarding crisis recovery, disruptive change, and their concept of the new-normal, post-COVID-19

era were explored within the context of P-12 technology implementation and through the lens provided by Bolman and Deal's (2017) four-frames model.

This qualitative descriptive design study was conducted to examine how seven superintendents in upstate New York school districts applied their leadership skills during district-wide technology implementation within the context of the COVID-19 crisis, which can serve to add to the limited body of research in leading technology implementation at the highest level of P-12 public school district leadership.

The remainder of this work is divided into four chapters. Chapter 2 synthesizes the relevant literature associated with P-12 public school-district technology implementation, relevant leadership practices, associated leadership models and theories, organizational change, and crisis innovation and management. Chapter 3 provides a detailed rationale and explanation of the study design and implementation. Chapter 4 presents an analysis of the data to report the outcomes, and Chapter 5 includes a summary of the study findings, conclusions, and recommendations.

Chapter 2: Review of the Literature

Introduction and Purpose

The literature review is organized to provide a general review of school-district superintendent technology implementation leadership research while exploring the inherent challenges and outcomes associated with leading technology implementation in the COVID-19 era. This study serves to inform the current knowledge of applying superintendent leadership in district-wide technology implementation and the introduction of urgency in the midst of the COVID-19 pandemic. The convergence of superintendent leadership, superintendent technology implementation leadership, leadership, and the perceived application of leadership during the COVID-19 pandemic are considered and reviewed within the context of Bolman and Deal's (2017) four-frames model.

Superintendent Leadership.

In a review of research conducted by the NPBEA (2015), 10 leadership standards were identified as foundational in meeting 21st century learning environment challenges. The standards are identified as:

- Standard 1. Mission, Vision, and Core Values
- Standard 2. Ethics and Professional Norms
- Standard 3. Equity and Cultural Responsiveness
- Standard 4. Curriculum, Instruction, and Assessment
- Standard 5. Community of Care and Support for Students

- Standard 6. Professional Capacity of School Personnel
- Standard 7. Professional Community for Teachers and Staff
- Standard 8. Meaningful Engagement of Families and Community
- Standard 9. Operations and Management
- Standard 10. School Improvement (NPBEA, 2015, p. v)

The NPBEA (2015) Standards address the importance of encouraging and leading the effective use of technology in teaching and learning, while also noting the importance of envisioning the future to prepare for both challenges and opportunities. Additionally, the standards support the increased influence superintendents have in achieving desired learning outcomes.

Waters and Marzano (2006) provided a synthesis of research through a meta-analysis of 27 studies involving 2,714 school districts, 3,500 ratings of superintendent leadership, and 3.4 million student achievement scores. The meta-analysis consisted of studies involving district leadership and student academic achievement in the United States between 1970 and 2005. Their research questions considered (a) the strength of relationship between district-level leadership and student achievement and (b) the specific leadership behaviors associated with student achievement.

The meta-analysis indicated a correlation between district leadership and student achievement (Waters & Marzano, 2006). The results indicate an overall correlation of $r = .24$, which is statistically significant at the .05 level. The researchers suggested that the noted results indicate that an increase of one standard deviation in leadership ability, or acumen, may provide for the prediction that student achievement will subsequently increase by 9.5%.

Waters and Marzano (2006) identified five specific areas, actions, or responsibilities most associated with effective district-level leadership. The first is identified as leading the process of collaborative goal setting. Waters and Marzano (2006) described this responsibility as a process by which leaders include all stakeholders in establishing district-wide goals. Fullan and Quinn (2016) described the outcome of successful collaborative goal setting as the incorporation of the talents of all stakeholders to find solutions to complex problems.

In addition to setting goals, Waters and Marzano (2006) also identified the responsibility of establishing nonnegotiable goals for achievement and instruction. Leadership serves to ensure that goal-setting results in establishing associated nonnegotiable goals that are clearly communicated and supported implicitly and explicitly by all. Of the eight districts responding in the study, researchers found a correlation ($r = .33$, $p < .05$) between student achievement and district leadership establishing nonnegotiable goals for both achievement and instruction.

Other areas where Waters and Marzano (2006) found a significant correlation between aspects of superintendent leadership and student achievement include: (a) district board of education's alignment with support of district goals ($r = .29$, $p < .05$), (b) use and support of resources in supporting goals of achievement and instruction ($r = .26$, $p < .05$), (c) superintendent's relationship with schools ($r = .28$, $p < .05$), and (d) monitoring goals for achievement and instruction ($r = .27$, $p < .05$). A caveat to the Waters and Marzano (2006) study suggests that their findings indicate that despite the correlation between superintendent leadership and student achievement, school building autonomy is also associated with student performance and achievement ($r = .28$, $p < .05$).

In addition, the study noted a negative correlation between site-based oversight and student achievement ($r = .16$, $p < .05$). Waters and Marzano (2006) noted the contradiction and suggested that superintendents define both goals and expectations for building leaders and allow the leadership at this level to work autonomously within these guidelines.

Meador (2016) described the role of a superintendent as the chief executive officer or CEO of the school district with responsibilities noted as financial leaders, head of operations, and lead in political matters. Although the delineation offers insight into the broad responsibilities associated with the position, the outcomes associated with their work and the ever-changing learning environment suggests the need for greater depth of understanding regarding their role. As the role of superintendent continues to develop and evolve, the work of Richardson and Sterrett (2019) suggests that innovations in technology provide them with both challenges and opportunities.

Superintendent Technology Leadership.

Research is limited regarding how superintendents apply leadership when implementing P-12 technology. In a study conducted by Richardson et al. (2012), only 37 articles were located that considered topics in leading technology implementation in P-12 environments that were in alignment with the standards provided by the National Education Technology Standards for Administrators ([NETS.A], ISTE, 2021). NETS.A (ISTE, 2021) is now part of the ISTE Standards where ISTE has divided the NETS.A between the standards for administrators and the standards for education leaders (ISTE, 2021). ISTE serves as a professional learning community for P-12 educators in support of digital learning and provides a series of standards guiding the effective use,

implementation, and integration of technology. In addition to supporting standards in PK-12 education, ISTE serves as the source for two peer-reviewed academic journals dedicated to the topic: *The Journal of Research on Technology in Education and the Journal of Digital Learning in Teacher Education* (Crompton, 2014). The ISTE Standards for Education Leaders serves to provide focus for this study as it considers decades of research in determining the primary factors in leading PK-12 technology implementation, and it has been accredited by the Council for the Accreditation of Educator Preparation (ISTE, 2021).

The five ISTE Standards for Education Leaders include:

- Standard 1. Equity and Citizenship Advocate
- Standard 2. Visionary Planner
- Standard 3. Empowering Leaders
- Standard 4. Systems Designer
- Standard 5. Connected Learner (ISTE, 2021, para. 2)

The NPBEA and ISTE Standards, as well as the available research, suggests the need for a broad range of necessary leadership skills to facilitate technology implementation at the district level (ISTE, 2021; McLeod et al., 2015; NPBEA, 2015; Waters & Marzano, 2006). Hallinger (2011), in a review of over 40 years of empirical studies, identified six specific qualities associated with leadership for learning that may serve to assist in developing models and practices for implementing and leading district-wide technology. The review of research presented by Hallinger (2011) suggests that (a) values and beliefs, (b) goals and vision, (c) leadership focus, (d) capacity building, (e) contexts for leadership, and (f) sharing leadership serve as essential aspects of

leadership in a learning environment. Taken independently, as well as in conjunction with similar research, these qualities serve to inform the application of technology leadership with a framework similar to that described by Fullan and Quinn (2016). Fullan and Quinn's (2016) coherence leadership framework is presented in four elements including (a) focus direction, (b) cultivate collaborative cultures, (c) deepen learning, and (d) secure accountability.

Research is beginning to surface regarding the application of superintendent leadership in the implementation of P-12 technology. Although Dexter et al. (2016) noted few empirical studies relating to the subject, research has surfaced that furthers the understanding of school-district technology leadership. Richardson and Sterrett (2018), in a study comparing superintendents recognized by eSchoolNews (Bradburn & Osborne, 2007) as tech-savvy, serving from 2001and 2010, with those serving between 2011 and 2014, found that their application of leadership has progressed from first-order to second-order changes. The researchers identified first-order changes as those associated with the implementation of technology and second-order changes as those supporting teaching and learning. In a subsequent study, Richardson and Sterrett (2019) revisited work with the second superintendent cohort (2011–2014) and identified four challenges associated with applying district-level technology leadership. Their findings suggest the need to meet stakeholder needs, support professional development, fostering a change mindset, and address stakeholders' fears.

Challenges in applying leadership in P-12 technology, such as those noted in previous research (Richardson et al., 2018, 2019), may be aligned with standards proposed by the ISTE (2021) or practices suggested and proposed in the literature. Dexter

et al., (2016), in a review of technology leadership preparation research, proposed action in four domains that may serve to assist in meeting the identified challenges. Where Richardson and Sterrett (2019) noted the challenge of fostering a change mindset and addressing stakeholder fears, Dexter et al. (2016) suggested the facilitation and communication of a shared vision. Additionally, taken collectively, Richardson and Sterrett's (2019) and the Dexter et al. (2016) findings note the importance of leadership in providing a safe and supportive environment where leaders build capacity through empowerment and accountability.

Several common themes emerged throughout the literature that helped to define and uncover the skills superintendents need to lead P-12 technology. Of these, promoting and developing a shared vision, engaging and empowering stakeholders, ensuring equity and access, and providing professional learning opportunities become most evident (Dexter et al., 2016; Cole & Sauers, 2018). Leadership in providing access and equity may prove a priority given the current data from the New York State Education Department ([NYSED], 2021) suggesting that over 71,000 students lack access to a dedicated computing device, with more than 165,000 students reporting insufficient or unavailable internet connectivity.

Equity and Access

According to the ISTE (2021, September 9), one of the critical elements necessary to effectively leverage technology for learning is the equitable access. They define such access as, "Robust and reliable access to current and emerging technologies and digital resources, with connectivity for all students, including those with special needs, teachers, staff and school leaders" (ISTE, 2021).

Over the past several decades, attempts have been made to provide both equity and access through various one-to-one initiatives. One-to-one programs provide each student with a personal digital learning device such as an Apple iPad, Chromebook, or laptop. Despite generally positive feedback from experts regarding these and other similar implementations, many school districts have opted to terminate or otherwise reconsider these large-scale programs (Gilbertson, 2014; Katcher, 2014; Liu et al., 2014; Piper et al., 2017; Tondeur et al., 2017).

One-to-One Implementations

In previous implementations, various factors contributed to failed or terminated one-to-one programs. One of the most notable and widely publicized examples is the Los Angeles Unified School District (LAUSD) Apple iPad initiative (Lamb & Weiner, 2018). Although barriers to success were explored, the essential points of failure were expressed as a lack of shared vision or organizational coherence. West-Burnham (2010) posited that a shared vision serves as an important driver because it provides focus, informs planning, clarifies and prioritizes work, creates a common language within the organization, and helps characterize organizational culture, relating to its values, mission, and goals. Although a district-wide vision may have been developed and communicated, in the case of the LAUSD technology initiative, it was not shared by all stakeholders (Lamb & Weiner, 2018).

Other similar implementations, such as the Liverpool CSD's one-to-one laptop program, failed due to what school officials described as the "process" (Johnson, 2008). The internal Liverpool CSD report found that the rollout suffered from the leadership's inability to engage stakeholders and to navigate internal politics. The leadership also

lacked professional development that could have helped them with complex financing, technical issues, and infrastructure problems (Johnson, 2008).

Although the failure points in the West-Burnham (2010) and Johnson (2008) studies are described and reported differently, common themes, when applying leadership at the district level, become readily apparent. In both implementations, stakeholders lacked in what Fullan (2003) described as a shared vision and organizational coherence. Both concepts require an alignment of beliefs and actions as well as a well-developed, leadership-guided, shared understanding of the nature of the work and associated goals (Fullan, 2003).

Expectations associated with one-to-one implementations have varied, with student academic achievement most prevalent (Warren, 2014; Zheng et al., 2015). In a meta-analysis of 10 one-to-one programs measuring the impact on student academic achievement, improved performance was reported in English language arts with an average effect size of $d = .15$. Writing showed a positive effect size of $d = .20$. The math results were mixed, with an average effect size of $d = .16$ (Zheng et al., 2016). Several one-to-one studies found no effect, or, in at least one case, that students in the non-one-to-one classrooms outperformed those in their first year of implementation (Clariana, 2009; Shapely et al., 2011).

Despite mixed results from past one-to-one implementations, the COVID-19 pandemic, and the resulting transition to remote learning, the debate regarding such implementations is a moot point—at least temporarily. As districts move toward remote instruction necessitating the need for devices such as Chromebooks or iPads, the need for

high-speed internet access becomes equally essential (Vogals, Perrin, Rainie & Anderson, 2020)

High-Speed Internet Access

In addition to providing a device for all students, school districts are confronted with the fact that, nationally, 30% of all public P-12 students reside in homes without a connection or device sufficient for online learning (Federal Communications Commission, n.d.). In New York State, 6.3% of P-12 public school students lack sufficient internet access with cost reported as the most significant barrier (NYSED, 2021). Additionally, the NYSED (2021) report noted that close to 8,000 teachers lacked access to a device in their homes or adequate access to the Internet. Most teachers reported a lack of high-speed internet providers as their primary barrier, particularly in rural communities.

The "Preliminary Fall 2020 Digital Equity Survey Results" (NYSED, 2021) identified that 69% of all P-12 public students were provided with a school or district device, with 14% provided with internet access by their school or district. According to the report, district- or school-provided internet was given as a device or service, not to include Wi-Fi in common areas such as parking lots, specified locations, or school busses. The report indicates that sufficient internet access is defined as reliable and lacks significant or regular problems. Problems were further defined as slowdowns, buffering, disconnections, or unreliable connections.

In addition to providing equity and access, the literature generally supports and reinforces superintendents leading and facilitating professional learning opportunities (Dexter et al., 2016; Sauers et al., 2014). In addition to decades of research supporting

professional development as an important factor in the implementation of P-12 technology, the transition to remote learning compels many teachers to learn a different modality of instruction (Hamilton et al., 2020).

Professional Development

A consistent theme throughout the research in technology implementation is the importance of professional learning opportunities for teachers and the crucial role leadership plays in facilitating this element (Harris et al., 2016; Levin & Schrum, 2012; Lewis, 2016; Richardson & McLeod, 2015; Simmons & Martin, 2016). As Dexter (2011) suggested, when compared to an individual leader, a team of skilled practitioners empowered to lead will more likely and collectively embody the skills and expertise necessary to facilitate the change associated with technology implementation.

A wealth of research exists regarding the shared leadership continuum in developing teacher professional capacity and growth (Andrews & Lewis, 2004; Danielson, 2006; Marzano & Waters, 2009; Spillane et al., 2001). Lewis (2016) suggested that supporting teacher education/learning through collaboration may serve as a pivotal factor in the success of technology implementation such as one-to-one mobile device programs.

As the mindset shifts from the practical needs of technology implementation, such as budgets, hardware allocation, equity, sustainability, and infrastructure, professional development surfaces as a recognized critical factor in establishing and inspiring second-order change (Richardson & Sterrett, 2019). Richardson and Sterrett (2019) further characterize second-order change within the context of professional development by noting the shift toward fostering a mindset change.

Karlin et al. (2018) found that the way in which technology leaders implement technology professional development can have an impact on the overall adoption and success of technology integration. In a study by Karlin et al. (2018) conducted with K-12 technology leaders and members of ISTE ($N = 153$), technology professional development was planned based on district needs without the use of a needs assessment. Additionally, participants reported the use of varied approaches to professional development yet lacked continuity or a plan for sustainability. Lastly, evaluation of technology professional development efforts was generally unsystematic (Karlin et al., 2018).

Given the importance associated with professional development in the process of applying leadership in P-12 technology implementation (Sauers et al., 2014), resources such as ISTE standards for educational leaders (2021) and guidance offered in the literature, may prove helpful in developing effective professional learning opportunities (Karlin et al., 2018). Common themes regarding ways in which technology professional development may be approached include needs assessments, plans and resources that facilitate continued opportunities for learning, evaluation of professional development, and research-practice partnerships (Karlin et al., 2018).

Implementing effective technology professional development may involve harnessing the skills and abilities of others within the learning community such as coaches or mentors (Duran et al., 2011). Involving stakeholders, such as mentors and coaches, brings both familiarity, trust, and fear-belaying opportunities for those who may be resistant to change (Ehsanipour & Zaccarelli, 2017) and engages them in the implementation process.

Stakeholder Engagement

Mission, vision, and core values are considered the NPBEA's (2015) first 10 essential K-12 leadership standards. In parallel with these standards, research indicates the necessity for district leaders to effectively facilitate and communicate these associated ideals with their stakeholders (Brooks-Young, 2013). Poynton et al. (2018) identified stakeholder engagement as a deliberate process of meeting challenges, sharing information, developing and building relationships, and seeking input from all members of the learning community.

Several themes emerged as a result of the Poynton et al. (2018) study for considering ways public school districts might increase capacity for public participation and improved problem-solving practices. The first of the emerging themes was identified as knowledge. According to survey respondents, 88% of the participants (n = 59) agreed, or strongly agreed, that through a newly adopted stakeholder-engagement process, greater knowledge was acquired, and a higher level of interest was reported. A second theme emerged in which 67% of the participants agreed or strongly agreed that relationships with school officials improved. Stakeholders noted that access to school officials, such as the superintendent, provided knowledge and a sense of empowerment. Other themes discussed were stakeholders' willingness to participate with school district officials as a result of relationship-building efforts and the overall efficacy of stakeholder engagement efforts. In each case, respondents reported that they were more involved and more likely to participate (Poynton et al., 2018).

In a previous study, Lambert (2003) suggested that effective district-level leadership can be further enhanced and reinforced by collaborating with stakeholders to

ensure coherence with vision and policy. Failure to engage stakeholders has been described by several authors, and it is characterized by partisanship, poor communication, and the catalyst for adversarial interactions between school district officials and the larger community (Auerbach, 2007; Mathews, 2006).

The NPBEA (2015) Standards are defined through a series of elements and attributes that assist in synthesizing each criterion. For example, they suggest that effective district leaders should exhibit the ability to create, execute, facilitate, and embody the work associated with academic achievement through shared values, mission, and vision. Additional elements under the Standard 1 suggest that effective leaders in a K-12 environment should support these standards by facilitating collaboration and by modeling shared stakeholder- and community-defined values. The NPBEA (2015) further describes elements associated with collaborative goal setting and a shared understanding and commitment to these goals. Waters and Marzano (2006) suggested and the NPBEA (2015) described effective district leaders will create, develop, facilitate, and account for the vision and goals associated with academic success, student achievement, and learning community accountability.

Vision, Mission, Planning, and Coherence

In addition to providing an organizational environment that empowers stakeholder-leaders, the most often-noted superintendent responsibility is in developing, creating, and fostering a shared vision. While the mission conveys an organization's purpose, the vision details how the organization will look and operate once the established goals are met (Kowalski et al. & AASA, 2011). Providing a vision assists in unifying organizations, and visions are found consistently throughout leadership research

(Bennis & Nanus, 1997; Johnson & Hackman, 2018; Kowalski et al. & AASA, 2011). Johnson and Hackman (2018) stated that a leader's ability to effectively communicate a vision may serve as the most important role of a transformational leader. Maxwell (1993) stated that leaders must influence people to motivate them. By doing so, they can be shifted toward a direction that will serve to improve the organization.

A well-developed and communicated vision serves as the catalyst for change, and it can help shift an organization in the desired direction (Covey, 2004; Fullan, 1993; Kouzes & Posner, 2014). This concept was further supported by Bennis and Nanus (1997) who provided several characteristics associated with both the communication and development of an effective vision, which, if implemented effectively, can energize followers by providing meaning to the associated work. Bennis and Nanus (1997) also described how a well-formed and articulated vision can establish standards for excellence and serve to connect the present and the future. Bolman and Deal (2017) considered the power of vision by noting that when communicated effectively, it can transition an organization's sense of purpose and ideology into a vision for the future.

The relative importance of developing, facilitating, and communicating a vision is strengthened by the ISTE (2012) Standards focused on visionary planning. Fullan and Quinn (2016) described the necessity of visionary planning as a process of continuous redefining, defining, communicating, and shaping pathways for a new vision. By setting directional vision, leaders provide the means for experimentation and autonomy within the set framework. Leaders are entrusted to foster an environment that inspires innovation and ideas through both purpose and challenge (Sinek, 2009). In addition, research shows that effective schools rely on a district leaders' ability to communicate the mission of the

learning community and that the essential goal is to articulate both the mission and vision to provide focus and unity (Brooks-Young, 2009). The overarching premise of vision, mission, communication, and strategic planning are described within ISTE (2021) Standard 2. The role of district leaders is emphasized in (a) facilitating collaboration to develop a shared vision, (b) developing a strategic plan in line with a shared vision, (c) establishing accountability measures to shift as data indicate, (d) communicating to provide stakeholders with opportunities to share and contribute, and (e) providing other leaders with information regarding experiences associated with lessons learned to effect global change (ISTE, 2021).

Brooks-Young (2009) helped to solidify the importance of conveying a mission and vision, both of which serve as foundational in the ISTE Standards (2021) and the NPBEA Standards (2015). Fullan (2002) provided further clarity regarding these phenomena by suggesting that district-wide success is promulgated on how effectively the system works together to achieve common goals. Numerous studies reinforce the concept that to achieve common goals, district leaders, especially the superintendent, effectively acts as a conduit and central resource between school district stakeholders and the associated vision (Byrom & Bingham, 2001; Dexter, 2007). McLeod et al. (2014) noted the various skills required to lead technology implementation at the P-12 level, but the researchers went to great lengths to detail the imperative nature in conveying a shared vision. Among the noted common themes, McLeod et al. (2014) found that superintendents most often cited shared vision, communication, infrastructure, and professional development as critical leadership skills and themes in their respective role.

While the literature helps in the discovery of challenges school district leaders face when implementing technology, it may also provide insight into the application of leadership in meeting those challenges (Ricardson et al., 2019; Sauers et.al., 2014). Much of the research within this field suggests the importance of developing, facilitating, and communicating the vision associated with implementing technology (Sauers et al., 2014). Bolman and Deal's (2017) four frames of leadership offers an opportunity and lens into the leadership style and behaviors school district leaders apply when leading 21st century P-12 technology implementation challenges.

Bolman and Deal's Four Frames Model

Bolman and Deal's (2017) research regarding the four frames of leadership provides quantitative evidence that the proficient and skilled application of each frame empowers individuals to successfully lead their organizations. While each frame provides a means to navigate and view organizations, they also assist in reframing perspective and perception of how they are lead. The four-frames model offers a window to help categorize and view leadership within the context of this study and serves as both a lens and structure in determining meaning. The four frames identified by Bolman and Deal (1997), are the human resource frame, structural frame, political frame and symbolic frame.

Human Resources Frame

The human resources frame is characterized by its focus on human needs and assumes that when those needs are met, the organization will function most effectively. Generally, leaders applying the human resources frame, apply leadership through the development of relationships, and they solve problems based upon interpersonal synergy

between the organization and the individual (Bolman & Deal, 2017). The human resources approach facilitates a sense of belonging where stakeholders are valued for their contribution from a team perspective (Collins & Porras, 1994).

The human resource frame fits well with the ISTE (2021) Standards identifying the need for leaders to engage stakeholders in developing a shared vision. Leading from this frame may help superintendents meet challenges identified in the literature such as fear associated with change (Richardson & Sterrett, 2019). Leading from the human resources frame may also contribute to greater job satisfaction as stakeholders feel more valued and empowered (Collins & Porras, 1994).

The Symbolic Frame

The symbolic frame suggests that organizational constructs, such as stories, myths, and symbols, provide a shared sense of mission and collective understanding. Leaders applying the symbolic frame will provide individuals with a sense of purpose by inspiring them through the creation of a motivating vision or a distinct organizational symbol (Bolman & Deal, 2017).

Myths, traditions, rites, and rituals characterize the symbolic frame with organizational culture driven by unique traditions and symbols (Deal & Kennedy, 1982). The emphasis on organizational and cultural symbolism helps maintain an organization's continuity and cohesiveness (Bolman & Deal, 1997). School district leaders will exemplify the application of leadership within this frame by prioritizing school culture, reiterating its mission, facilitating and relying on its vision, and emphasizing core values.

Engaging stakeholders in the implementation of P-12 technology is both challenging and essential (ISTE, 2021; Richardson & Sterrett, 2019). A sense of

belonging and identifying a mission and vision through imagery and symbols may help encourage stakeholders in becoming actively involved in the process. Feeling part of an organization rich in history and steeped in tradition builds community, organization, and school engagement (Bolman & Deal, 2017.

The Structural Frame

Leaders applying the structural frame are focused on data, analysis, and accountability. Applying leadership utilizing the structural frame is promulgated by the development of rules, policies, and organizational guidelines followed by associated accountability measures (Bolman & Deal, 2017). It is within this frame that organizational and school leaders apply structure to the process of leading. Defining roles and responsibilities and setting accountability measures characterize the structural frame (Bolman & Deal, 2017).

By applying leadership through the structural lens, a superintendent or district leader may bring order and process to an otherwise complex implementation process (Bolman & Deal, 1997). To some degree, challenges identified by Richardson and Sterrett (2019), such as providing professional development, may be addressed by applying leadership through the structural frame. For example, the literature identifies a process for planning that sustains professional development in conjunction with the implementation of new technology and suggests the requirement for a needs assessments, an evaluation, accountability, and other noted attributes (Karlin et al., 2018). The application of the structural frame in leading technology professional development serves to provide order, accountability, measurable outcomes, and logic (Bolman & Deal, 1997).

The Political Frame

The political frame assumes a constant conflict between individuals and groups. Conflict can be identified as differing agendas, values, or beliefs. Applying leadership using the political frame would be characterized by the building of coalitions, developing a power base, and the use of negotiations (Bolman & Deal, 2017).

The political frame presupposes the existence of organizational coalitions with each having their own agenda. The result is a divergence in areas, such as values and beliefs, and, subsequently, differences in setting and achieving goals. Resource scarcity, conflict, and entrenched, yet separate, coalitions result in establishing power as the most valuable commodity. Decisions are made through negotiation and by those who have established a power position within the organization (Bolman & Deal, 1997).

Although the political frame is described as the "jungle" due to its grounding in conflict, Bolman and Deal (1997) noted that conflict is essential in successful organizations. Green (2017) suggested that conflict in various forms, such as power struggles and disagreements, can be resolved by strategy and negotiation, each a tenant of the political frame. It is within the political frame that strategic planning to win occurs. Ultimately, this serves to help school leaders meet challenges associated with the everchanging P-12 landscape (Lunenburg & Orstein, 2011).

The literature generally supports that school district leaders apply leadership through both the structural and human resource frames (Mosser & Walls, 2002). However, developing skills in each provides district superintendents with the flexibility and versatility to apply leadership as situations demand. Transitioning between frames, or "reframing," and the ability to combine frames; or to "multi-frame," helps leaders meet

various challenges and assists in leading organizations through change such as transitioning a school district to remote learning (Bolman & Deal, 1997; Netolicky, 2020).

Multi-framing

Bolman & Deal (2003) identify multi-framing as an ability to apply multiple leadership perspectives while thinking about the same thing in more than one way. Thompson (2000) suggests that a relationship exists between leadership effectiveness and frames used where conversely, a leader who responds to situations from a single lens are left attempting to reshape the situation or are ultimately limited in response (Bolman & Deal, 2003). Bolman & Deal (2003) further explain multi-framing as effectively understanding the complex nature and intersection of events, individuals and organizations and an individual's ability to apply leadership through all four frames. A further distinction is made through both an evaluation of multi-framing as it applies to differences between management and leadership. The structural and human resources frames are predominantly described as managerial in comparison to the political and symbolic frames which are more closely associated with leadership (Bolman & Deal, 1991).

Frames and superintendents

Several studies considered superintendent leadership styles through the four frames model. Strickland (1992) found that superintendents generally applied leadership from multiple frames with structural and human resources frames identified as most preferred. Conversely, findings indicated the symbolic frame used less frequently. Contrary to Strickland's (1992) findings, Harlow (1994) noted that superintendent

leadership was most characterized by the use of one or two frames with the political framed identified as most employed by experienced practitioners. Additionally, Harlow (1994) indicated that superintendents describe themselves as applying leadership predominantly from the human resources, political, structural and symbolic frames respectively, while indicating a predisposition toward the structural frame in times of crisis.

Distributed and Shared Leadership

With much of the research indicating a broad spectrum of skills and areas of leadership needed to accomplish large-scale, district-wide technology implementation (Cole & Sauers, 2018), the concept of distributed and/or shared leadership offers superintendents with the opportunity to build capacity by employing such methods and by empowering others who may excel in the identified areas of need (Spillane, 2005).

Subtle yet important distinctions exist between shared, collaborative, and distributed leadership approaches. Jameson (2007) provided an overview of each, describing distributed leadership as specifically distributing tasks and responsibilities while not necessarily having knowledge, power, or authority. Jameson (2007) argued that collaborative leadership incorporates distributed leadership aspects by sharing all leadership responsibilities, while shared leadership exhibits qualities of both distributed and collaborative leadership. The three noted leadership styles represent a continuum where collaborative leadership is described as the most democratic and relational approach.

Gronn (2002) defined distributed leadership as a network of individuals who provide their practical expertise and knowledge base. Spillane (2009) further defined

distributed leadership as tasks that are stretched amongst a group of interacting individuals within an organization. These individuals serve within an integrated socially connected group. Some disagreement exists regarding the individuals who share leadership within the noted context because only those identified as serving on a leadership team participate (Camburn et al., 2003). Others argue that anyone in an organization with the capacity to complete associated tasks can both lead and serve (Copland, 2003). Harris (2007) considered a broader definition of distributed leadership because it is often attributed to any form of leadership that is shared. Harris (2007) further noted that the broad definition of distributed leadership also contributes to its inherent weakness.

The mindset shift, or a transition to second-order change toward instructional focus, is relevant to the shared leadership continuum. Although research suggests that it is the primary role of the superintendent to foster and create a shared vision, distributing the role among building and community leaders is noted as an essential skill and challenge (Richardson & Sterrett, 2018). Enlisting and empowering others to lead in an endeavor to shift the focus from implementation to instruction is identified by many researchers as a critical factor and essential challenge for superintendents (Dexter, 2011; Levin & Schrum, 2012; Richardson & McLeod, 2015; Richardson & Sterrett, 2016; Simmons & Martin, 2016). Lewis (2016) suggested that supporting teacher education/learning through collaboration may serve as a pivotal factor in the success of technology implementation such as one-to-one mobile device programs.

Leading Organizational Change

The implementation of technology throughout a school district constitutes a significant organizational change that can result in unexpected or unforeseen consequences (Miles, 1993). The existing literature regarding leadership through organizational change is extensive and complex, and it is often grounded in Kurt Lewin's 1947 three-steps model (Cummings et al., 2016). Lewin (1947) described organizational change as a three-step process beginning with unfreezing an old behavior, transitioning to a new behavior, and refreezing at the newly obtained behavior (unfreeze-change-freeze).

The nature or catalyst for change is attributed to forces associated with the external or, conversely, the internal environment. External causes are described as political, economic, social, or technological, whereas internal causes generally derive from a leader's vision, level of organizational communication, and structure and growth through learned experiences (Burnes, 1996). Twenty-first century learning skills provide an example of an external cause for change. As societal needs evolve, school districts are compelled to adopt and implement associated learning standards and related methods of instruction, whereas an internal catalyst, such as new leadership, change an organization from within (Mullins, 2007). The implementation of school-district technology may serve as an example of both, given that it represents the needs of stakeholders desiring to meet external educational challenges by shifting internal resources and opportunities (Hur et al., 2016). As both internal and external changes come to fruition, the methods employed by leaders to facilitate such change become essential (Nadler & Tushman, 1990).

First- and Second-order Change

Shifting school districts from technology implementation to supporting teaching and learning is described by Richardson and Sterrett (2018), as a transition from first- to

second-order change. The literature describes a distinction between first- and second-order change as differences between what is described as superficial, as in first-order change, or transformational, as in second-order change. First-order change is characterized by improving a current process through incremental modifications. Second-order change is generally described as transformational and results in an irreversible organizational change (Levy & Merry, 1986). Second-order change is generally associated or influenced by a crisis such as the COVID-19 pandemic (Netolicky, 2020) or the inability to meet the needs of 21st century learners (Kezar & Sam, 2013;).

Systemic Change

Systemic change within a school district occurs when a superintendent adopts a vision to see the change through to fruition (Schlechty, 2005). Schlechty (2009) furthered this concept by describing the transition to 21st century learning as transformational because it requires a metamorphosis toward a radically different means of doing work. The necessary leadership application requires superintendents to engage in efforts to facilitate systemic change. Superintendent leadership research by Waters and Marzano (2006) reinforced the concept of first- and second-order change, and they described how the application of leadership is often attributed to stakeholder perception and that superintendents must gauge the impact of change in order to implement successfully.

Crisis Leadership

According to Pearson and Clair (1998), a crisis involves the introduction of complex problems that relate and impact the psychological-relational, structural-technological, and socio-political domains. They defined a crisis as an event or series of

events that have pervasive consequences, both internally and externally, to the organization, and they involve multiple, often conflicting, stakeholder interests.

Generally, three categories of research are evident in crisis leadership. The first category is associated with the application of leadership in response to an exceptional event. The focus of leadership within this category is in managing and applying leadership activities and behaviors to mitigate an exceptional circumstance (Hannah, 2009). The role of a leader differs within and among the various stages of a crisis, and the focus is on how they may manage, prevent, and learn from the event (Pearson & Mitroff, 1993). Where the first category of crisis leadership is generally conceptual, normative, and descriptive, the second category is an empirically driven theory.

The second stream or category of crisis leadership research considers the varying effectiveness of leadership styles during a crisis. Research with this focus suggests that individual leaders and their ability to apply specific leadership attributes positively influence crisis outcomes (Mumford et al., 2007). Rather than focusing on strategy, management, technology, or psychology, the second category of research considers leadership style and organizational behavior (Pillai & Meindl, 1998). In this stream, researchers argue that charismatic and transformational leaders are generally more effective in crisis situations, yet they recognize that directive transactional leaders may fair better in certain circumstances (Yun et al., 2005).

The third category of crisis leadership research focuses on role-based functions varying over time and adapting to associated contexts. Much of the research within this stream suggests that leadership is a role rather than a style and that leadership is different in crisis than in noncrisis situations (Hadley et al., 2011; Uhl-Bien et al., 2007). Leaders

emerge in the midst of a crisis because it is their role, and the response to crisis is both contextual and temporal (Waller et al., 2014).

Each category of crisis leadership research offers insight and perspective in understanding the complexities associated with this phenomenon. Brockner and James (2008) argued that crisis may provide leaders with the catalyst to facilitate needed change where stakeholders are inherently self-motivated to positively respond (Klein et al., 2006). Previous research in the implementation of district-wide technology, such as one - to-one programs, has suggested stakeholder resistance (Deloatch et al., 2014), whereas the immediacy and urgency presented by a pandemic, such as the COVID-19 crisis, may serve to motivate stakeholders and assist superintendents to lead the change (Klein et al., 2006).

Crisis Innovation

Historical reference and decades of literature support the concept that crisis can inspire innovation (Field, 2003; Gross & Sampata, 2020). Similar to crises in the past, the onset of the COVID-19 pandemic created an immediate sense of urgency to shift or change current practice (Johnson & Murray, 2021). In times of crisis, organizational priorities, mission, vision, and resources often shift toward immediate needs. Problem solving becomes more focused and efforts become more intense (Gross & Sampat, 2020; Johnson et al., 2021). Crisis innovation is often exemplified in the literature by reviewing the number of technological and medical advances that resulted from research during World War II (Gross & Sampat, 2020). Medical advances in disease and infection were accelerated substantially with the development of drugs such as atabrine and chloroquine (Condon-Rall, 2000). Additionally, technological research in both atomic fission and

industrial production, set standards for energy advancements and national economic growth during and after the war (Gross & Sampat., 2020).

In time of crisis, such as the COVID-19 pandemic, leaders facilitate the process of unfreezing organizations in order to reprioritize needs and resources (Johnson et al., 2021; Lewin, 1947). Often, as in the case of transitioning all students to remote learning, the pre-crisis priorities are reconfigured to meet the most basic and urgent needs (Johnson et al., 2021).

Maslow's Hierarchy Model

Perhaps the key distinguishing aspect of the current state of the world in the wake of this global pandemic has been the rapidity and nature of the changes. With that in mind, the concept of Maslow's (1947) hierarchy of needs was extremely helpful, if not unorthodox, in determining which aspects of the work should be given the most overall prominence (Schulte, 2018). The basic concept of Maslow's (1947) hierarchy of needs is well known to everyone even vaguely associated with the field of education, so this section will simply provide an overview.

Maslow's (1947) hierarchy of needs is pyramidal in shape identifying the most basic of human needs at its base. At the next level up are the needs relevant to safety and personal security. Above those, concepts and attributes associated with relationships and belonging are needed. As the top is neared, the final layer or peak, denotes needs fulfilling one's full potential (Schulte, 2018). The top of the pyramid is reserved for the most esoteric of needs—those relating to self-actualization (Schulte, 2018).

Chapter Summary

Considerable research exists regarding a superintendent's role in affecting change (Marzano & Waters, 2009) and, in alignment with this theory, Richardson et al. (2015) suggested that technology leadership is "just good leadership." However, innovation and technology demand the evolution of leadership, and by its very nature, technology challenges leaders to evolve in parallel with the inherent and associated challenges (Richardson & Sterrett, 2018).

While research in superintendent leadership is available, literature informing the body of knowledge in the application of superintendent leadership in technology implementation is limited (McLeod et al., 2014). Adding urgency associated with a crisis such as COVID-19 further reduces the available research. As Pearson and Clair (1998) noted, the introduction of a crisis can inject both ambiguity and urgency, which characterizes the international pandemic since March of 2019. School districts were faced with the realization that technology implementation would transition from what is generally a methodical process to a situation necessitating the need to provide all students with remote learning technology, access to high-speed internet, learning opportunities resulting in similar in-person outcomes, relevant professional development for teachers, and provisions for associated funding. These urgent and timely needs involved leading through a crisis, whereby the ability to solve highly complex problems without sacrificing quality is essential (Sommer & Pearson, 2007).

Crisis leadership research was considered for this study given that superintendent leadership in district-wide technology implementation and the intersection of the COVID-19 crisis present a unique challenge. Crises may also provide opportunities for

leaders to foster change and growth (Brockner & James, 2008) by reprioritizing their leadership skills and adapting to both internal and external needs.

Chapter 3 discusses the methods utilized for this study. Chapter 4 and Chapter 5 provide associated results and an overview of the research findings.

Chapter 3: Research Design Methodology

Introduction

This chapter describes the rationale for the use of a qualitative descriptive design and provides a detailed outline of the methodology including research context, participants, setting, data collection, and analysis. In addition to the methodology, an explanation of the alignment between the research questions, research problem, and the overall research design is presented.

This research describes how some superintendents coped with implementing technology and how the COVID-19 pandemic may have changed their approach. This research can inform reforms to facilitate future P-12 technology implementation leadership.

Despite several decades of instructional technology use within P-12 environments, minimal research has been dedicated to the role the district superintendents play in the implementation of these costly, culturally disruptive, yet innovative, assets (Anderson & Dexter, 2005; Richardson et al., 2015; Schrum & Levin, 2009). The advent of the COVID-19 crisis presents additional layers of complexity that have both direct and indirect implications in the application of leadership within a school district (Harris & Jones, 2020). Previously, the primary role for a superintendent involved in leading various implementations has been described as providing vision or facilitating stakeholder processes, but the urgency in response to the COVID-19 crisis presented an unexpected yet unavoidable variable (Doucet et al., 2020).

Although various approaches to qualitative research exist, researchers may find that a subject worthy of study fails to fit neatly within a particular approach (Bradshaw et al., 2017). Qualitative descriptive design is a general term used to describe various research methods where data are obtained directly from those experiencing the phenomenon being studied, and the data assist in providing insight into the processes, perspectives, and views of those involved (Bradshaw et al., 2017). This study provides the groundwork for future theory development but, in itself, does not propose a new theory.

Where grounded theory provides the methodology and processes that allow researchers to develop theory through analyzing and focusing on collected data, a qualitative descriptive design serves as a foundational or fundamental process that seeks to understand how participants assign meaning or understanding to a particular phenomenon (Sandelowski, 2000). A qualitative descriptive design facilitates a process of discovery, understanding, and participant perspective producing an in-depth description of the participants' experience, perceptions, and associated events (Caelli et al., 2003; Lambert & Lambert, 2012).

This qualitative descriptive study adds to the available research regarding superintendent leadership, and it may serve to deepen our understanding of how school-district superintendents apply leadership in technology implementation and how their methodology may have transitioned as a result of the COVID-19 crisis. The purpose of this research was to understand and explore how school superintendents perceived the application of their leadership while implementing district-wide technology and how their

decisions, actions, and responses facilitated the process within the context of the COVID-19 crisis.

Research Context

This study was conducted utilizing a purposive sampling of 42 school superintendents from seven school districts in upstate New York that house the Board of Cooperative Educational Services (BOCES) schools. BOCES was established in 1948 to provide school districts, which were identified within their respective regions, with shared educational services and programs. Of relevance to this study is the role of the BOCES district superintendents who provide oversight and are responsible for component school district superintendents (BOCES of New York State, 2017).

A distinction between school districts considered for this study and those outside of the identified geographic area was warranted. The districts invited to participate are located in the central, southern, and northern regions of upstate New York. COVID-19 cases within the identified sampling areas remained significantly less than downstate locations such as New York City, Queens, and the Bronx (New York State Department of Health, 2021). Despite the geographic disparity associated with the pandemic within the state of New York, the school districts followed the standardized state-wide mandates and guidelines for school closures and online learning criteria.

The study sample included suburban, rural, and city school districts from the BOCES schools in upstate New York. The largest school district in the sample regions had approximately 20,000 students at the time of this study (NYSED, 2021). The smallest district enrolling approximately 400 students (NYSED, 2021).

In addition to other factors posted on the NYSED (2021) website, information such as enrollment and financial aspects, such as per-pupil spending, helped the researcher in understanding how leadership methods and decisions were applied in New York State. School district budgeting and financial aspects associated with technology implementation were identified in the literature as important aspects of superintendent leadership within the context of technology implementation (McLeod et al., 2015). Preliminary reports from the NYSED (2021) regarding equity and access to both the Internet and internet-capable devices suggests the need to consider the financial implications of providing these basic learning needs (NYSED, 2021). The samples canvased in the study ranged from a per-pupil cost of $32,460 per year to down to $20,549 per-pupil cost per year (NYSED, 2021). Specific per-pupil expenditures for samples included in this study are identified.

Other potential contextual factors were considered, such as the predominant socioeconomic status of each community, specific in-district experience of the participants, and the organizational structure of selected districts. The organizational structure of the school districts in New York State generally follows a model with a superintendent and board of education at the top of the organizational pyramid. Depending on financial resources, history, enrollment, and identified needs, administration among the districts can vary greatly (NYSED, 2021). Larger school districts (based on enrollment) employed various specialists and directors such as directors of technology, of operations, and/or of project management. Additionally, most school districts employed a business official for the purposes of financial management and oversight.

Research Participants

This descriptive design study was conducted with overtones of both grounded theory and case study methodology. Therefore, the sample size was predicated upon having participants represented from the school districts that varied in size, location, socioeconomic attributes, and organizational structure. Creswell and Garrett (2008) suggested a sample size of between five and 25 participants, while Magilvy and Thomas (2009) argued that sample size within qualitative descriptive research should be smaller given that the participants have unique qualities associated and identified with the phenomenon. Magilvy and Thomas (2009) recommended three to 20 participants, depending on the potential saturation point. In order to inform the research, seven participants were selected in congruence with the aim, context, and timing of this study (Smith & Osborn, 2009).

The function of providing purposive criterion sampling is used in cases where information is well suited to investigate the phenomenon of interest (Palinkas et al., 2015), and it is an essential aspect within qualitative research (Creswell, 2013). This research employed purposive and convenient sampling with seven school superintendents who had led district-wide technology implementation within 24 months of March 2020. The participants were selected through a criterion and convenient-based process for the unique or specific characteristics they embodied. In this case, they were school superintendents who self-identified as having led a district-wide technology implementation within the specified time period (Saldaña, 2015). The participants were part of a convenient sample and were familiar with the researcher who served, at the time of this study, as both a colleague and practitioner within the same sample region.

Additionally, the research participants were informed that their names and locations would remain confidential. The participants' requests to hold confidential any portion of the interview has been respected and signed informed consent forms were collected from the participants prior to their interviews, and they will remain on file with the researcher in locked secured storage for a period of 3 years at which time they will be shredded and discarded. In order to eliminate bias, the school district in which the researcher is employed in upstate New York has been excluded from this study.

Instruments Used in Data Collection

The purpose of this qualitative descriptive study was to develop an understanding of how school superintendents applied their leadership through the district-wide technology implementation with an emphasis on exploring this phenomenon within the context of the COVID-19 crisis. Although the concept of leadership by school district superintendents is well researched, the application of the leadership methodology in technology implementation with the imposition of COVID-19 is new.

Interviewing provides researchers with a full perspective of individuals' experiences, and through this process, they may uncover details that would not otherwise surface (Weiss, 1994).The examination of the participant responses allows for the researcher to probe beyond basic questioning and for the potential to unveil meaningful data (Gubrium et al., 2012). Open-ended questions were used for this study to further understand the participants behavior, experiences, and self-perception (Johnson & Christensen, 2014). The interview questions were previously tested with a request for feedback from the regional school superintendents who did not participate in this study.

From the upstate New York school districts, 42 superintendents who fit the prescribed criteria were invited by email (Appendix A) to participate in this study.

Interviews were conducted using Zoom video conferencing software with audio recordings at a time of the participants' choosing. Video conferencing was preferred due to the distance limitations associated with the COVID-19 crisis. Each interview session began with a prepared statement describing and explaining the purpose of this study (Appendix B). Semi-structured interviews were conducted using the strategies consistent with the methodology provided by Charmaz (2014). These included a series of topics that were generally associated with the role and function of a superintendent in executing a district-wide technology implementation. The topics included an overview of the participants' role and self-perceived leadership style, the role of technology in P-12 education, their perceived skill set as it related to P-12 technology, past and present related projects and implementations, and their reflections and self-assessments regarding success in meeting their technology goals. Additionally, the participants were asked to compare and contrast their experience both before and after COVID-19 as it related to their role in technology implementation. As the interviews continued, the researcher probed based on the participants' reflection, responses, and emerging themes.

The first series of questions were preceded by an explanation or scenario depicting and accurately describing samples of district-wide technology implementations. The examples included one-to-one student device programs; large-scale infrastructure projects with multilevel learning software applications for adoption with COVID-19 variables, such as urgency, equity, and remote learning; and other similar subjects. Follow-up questions were predicated upon the scenarios and responses provided by the

participants. Depending on the progress of the interviews, the researcher compiled potential questions that included a series dedicated to the participants' self-identified role; leadership skills; and practices in meeting related goals, successes or obstacles, and outcomes versus expectations.

A final series of probing questions were used to elicit reflection and consideration of alternative leadership strategies that may be employed during future implementations. In other words, "How might you do things differently considering your past or current experience?" Questions regarding shifts in future decision-making within the context of leadership allowed both the interviewer and the participants with the opportunity to shift the conversation beneath the surface. The goal was to discover leadership qualities through self-discovery that only reflection and inquisitive probing can uncover (Charmaz, 2014). A specific list of interview topic questions are located in Appendix C.

Procedures for Data Collection and Analysis

All interviews were video and audio recorded using the Zoom video conferencing online application, and they were transcribed for data analysis using a transcription service, along with a follow-up transcription to ensure the accuracy conducted by the researcher. NVivo Pro 11 was utilized for data analysis purposes. Recordings and transcriptions will be kept on file in an encrypted and secured password-protected digital format for 3 years following the completion of this study, at which time they will be destroyed by employing digital data deletion.

Data analysis was conducted using the qualitative method of open coding of the interview data. Open coding is described as the initial stage of qualitative data analysis revealing overarching themes, concepts, ideas, and theories through analyzing the

interview text (Corbin & Strauss, 2014). This form of data analysis consists of assigning codes derived from common terms or phrases extracted from the transcripts or identified by the researcher. These codes represent and summarize extracted words and phrases providing overarching themes and concepts (Corbin & Strauss, 2014). Initial transcription and coding for this study was conducted by a third party who provided what an analysis from a nonpractitioner's perspective. Second and third level coding was conducted by the researcher to develop what Goodwin (1994) referred to as "professional vision." Themes and categories emerged through the process of second-level coding.

The raw data extracted from the participant interviews were analyzed using specific and accurate key terms or phrases. No preexisting coding system was used, which is consistent with a qualitative descriptive design (Sandelowski, 2000). An inductive content analysis was used to identify open codes and form findings, categories, and themes (Thomas, 2006). Throughout the coding process, analytic memos consisting of questions or revelations that arose for the researcher were preserved. Recording thoughts and ideas during the process allowed the researcher to further analyze and reflect upon consistent themes, revelations, and potential pathways toward potential theories or models (Saldaña, 2015).

Summary

This chapter provided a description of the research design and methodology used to gather and analyze data regarding the application of school district superintendent leadership practices when implementing district-wide technology and their perception of leadership practices and methods in technology implementation as a response to the COVID-19 crisis.

Approval for this interview project and associated interview questions was received from the St. John Fisher Institutional Review Board (IRB) (Appendix D). Interviews were conducted over a 2-month period using video conference technology as a safety protocol during the COVID-19 pandemic. The video conferences were recorded and transcribed for the purpose of data analysis. The findings are presented in Chapter 4. Chapter 5 provides a discussion and overview of findings, limitations associated with the study, potential implications, and the opportunity for future research.

The goal of this qualitative descriptive study was to explore the lived experiences of practitioners who were leading efforts in P-12 technology implementation during unprecedented circumstances. Data obtained from semi-structured interviews with the superintendents from upstate New York were compared with research in superintendent leadership within the context of P-12 technology implementations. Proper protocols and actions were utilized to maintain credibility and trustworthiness.

Chapter 4: Results

Introduction

The purpose of this qualitative descriptive study was to explore how superintendents in Upstate New York apply leadership in implementing technology. Furthermore, the study seeks to understand how the application of leadership transitioned through the COVID-19 pandemic. Open-ended inquiry was employed to examine each research question within Bolman and Deal's (2017) organizational framework. The analysis is presented in three sections. The first section provides a description of how the data was coded. Sections two and three provide data and analysis respective of each research question. The process of analysis for each of the interview questions was to discern patterns to explore the essence of each emerging theme. Maxwell's (2013) data analysis process was followed by listening to each interview and reading the associated transcripts. Categories emerged through the coding process by rereading transcripts and reviewing third-party open coding results. Open coding was used to discover and develop emerging themes that aligned with the research questions. The second phase, or axial coding, was utilized to further explore patterns and merge, cluster and retitle themes. Substantive third phase coding was employed to assist in the interpretation and synthesis of meaning and the identification of essences within themes (Dahlberg, 2006; Creswell, 2014).

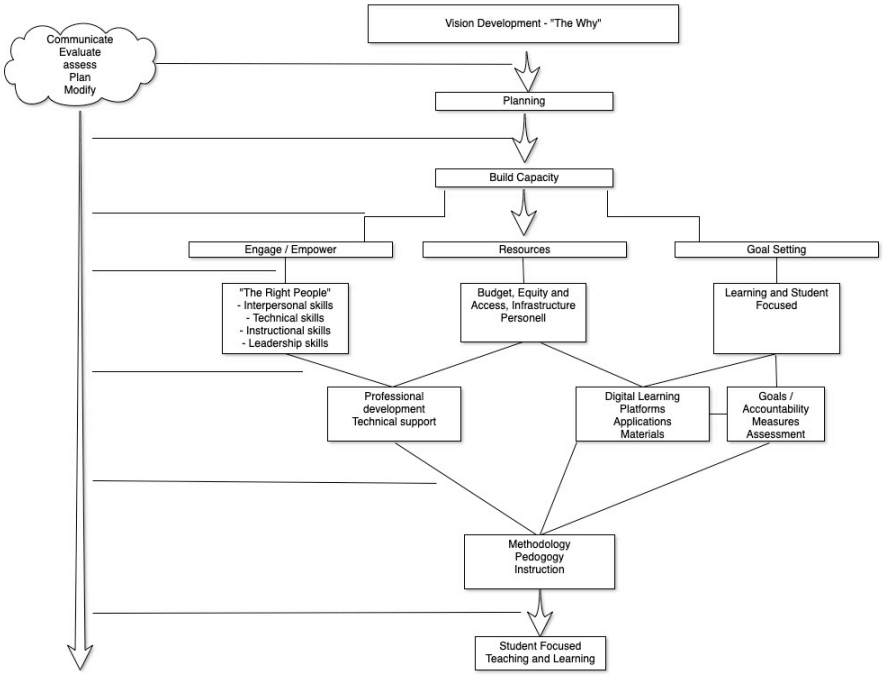
Data Analysis and Findings

Bolman and Deal's (2017) four frames provided a lens to help categorize and assign meaning to the manner in which the participants' leadership was applied and approached. Each of the frames were used to identify how the superintendents applied leadership with respect to the various aspects associated with the implementation of P-12 technology. Although the study employs Bolman and Deal's (1997) four frames model to provide structure, relevant insights extraneous to the structure emerged that are also presented as part of the findings and further discussed in Chapter 5.

Figure 4.1 illustrates the collective responses regarding the application of leadership in implementing P-12 technology without the imposition of a crisis such as the introduction of COVID-19.

Figure 4.1

Applying Leadership in Implementing P-12 Technology



Research Question 1

How do school district superintendents believe or perceive they are applying leadership practices while implementing district-wide technology?

Four themes emerged through the interview process. The themes were associated with all four of Bolman and Deal's (2017) frames: human resources, political, structural, and symbolic. The consistent themes that emerged were relationship synergy, conflict resolution, systems, accountability and prioritization, shared mission/vision, and buy-in. The first research question was developed to establish a baseline for understanding how the superintendents lead P-12 technology aside from the imposition of crisis such as the COVID-19 pandemic. The first set of interview questions were posed to elicit responses associated with the process or application of leadership within the technology implementation domain and helped in establishing a distinction between leading pre and concurrent to the crisis. Essentially, the first research question seeks to identify how superintendents perceive their application of leadership within the P-12 technology implementation context distinct from the addition of the pandemic. The second research question explores perceived changes in the application of leadership as a result of the onset of the pandemic.

Table 4.1 represents responses to the first series of questions created to establish a foundation regarding their perceived normal leadership acumen and behavior, distinct and separate from the onset of COVID-19.

Table 4.1

Perceived Application of Technology Implementation Leadership

Category	Theme	Essence
Human resources	Relationship synergy	Relationships matter Ease fear of change The right stuff (people)
Political	Conflict resolution	The power of communication Manage controversy
Structural	Systems, accountability and prioritization	Planning, action and accountability Refocus on what's important
Symbolic	Shared vision and buy-in	Engage, empower, and educate

Relationship Synergy (Human Resources). Relationship synergy emerged as the first theme. The human resources frame is characterized by care and support for others, listening skills, and interpersonal connections. All seven participants responded to questions by applying leadership practices from the human resources frame. Each provided responses that reflected their application of leadership toward developing synergetic relationships. Participant 6 discussed the importance of developing and fostering relationships as part of school leadership:

> So. the challenge is, or I think in terms of school leadership relationships matter, right? And relationships are really the key in both my experience as principal of a big building and as an executive director of instructional personnel. I noted and watched people who were very good at relationships or just struggled to bond.

The implementation of new technologies can result in adverse reactions from stakeholders, and, as Richardson and Sterrett (2019) noted, fear of the unknown poses a substantial challenge in the change process. It is therefore important that leaders

recognize and adopt practices to build confidence and belay fears (Graetz & Smith, 2010). Participant 1 shared how stakeholder engagement builds familiarity and buy-in:

> It's all about engagement and really engaging, having people who will ultimately be responsible across the spectrum for implementing these particular outcomes engaged in the beginning, so that they can both understand, and then they can be giving feedback and input so that we're constantly fine-tuning the planning system to meet the various needs.

Developing relationships and having interpersonal skills serves as a cornerstone within the human resources frame (Bolman & Deal, 2017). Participant 7 discussed the ability and personality of the director of technology with the implication that the director's personal and positive approach to professional development assisted in belaying stakeholder fear and in fostering a mindset change:

> Our IT director, that you and I talked about a few minutes ago, one of the . . . . And I don't mean this as an offense to anyone, but he has great interpersonal skills. Not something you always see, at least in my experience with technology. He really gets the instructional side of it as well as the technology side of it.

Indirectly, communication with stakeholders emerged as a common theme with all the participants. Consistent communication was identified as an ISTE (2021) and NPBEA (2015) standard for leaders. Consistent communication and stakeholder engagement were reported as common methods in facilitating buy-in. Participant 7 added:

> We had a lot of change coming into this fall, as everybody did. And our Community Engagement Committee from the strategic plan group felt it was

> important that we do a great job and a very specific job of communicating to our parents, to our kids, to our community.

Participant 2 shared how they developed synergy by understanding various perspectives and personal needs:

> So, when you're building that capacity, then that sort of generates the synergy that you want, and then you have to manage the synergy, because a lot of times, you'll have people that the things they create, or they want you to tell the rest of the people they have to do [the] X, Y, or Z thing. So, we often spend a lot of time talking about "that's not how this works." My big stick doesn't make change. It's how are we working with people and supporting people in ways that are meaningful and recognizing that we have people at all different places in the process.
>
> So, I think my role, at that point, sort of becomes expectation management, cheerleader, keeping people feeling excited, processing failure, really building growth mindset, not only with the team that's trying to lead a change, but also just with people in general and their capacity.

Conflict Resolution (Political). Conflict resolution emerged as a common theme throughout the process. School districts are political landscapes where accountability for student outcomes is both everchanging and commonplace. Expectations, both personal and political, often surface resulting in conflict, division, and power struggles. Superintendents must often serve to resolve conflict through the various aspects associated with the political frame (Bolman & Deal, 2017). The introduction of technology in P-12 classrooms sparked national debates and has often resulted in

divisions among stakeholders. In addition to budgetary and strategic concerns, the combination of fear associated with change and inconclusive research results regarding technology and student outcomes can divide learning community stakeholders (Johnson, 2008; Richardson et al., 2019). Participant 3 recognized how transitioning to a new technology can cause conflict, "We just went through a colossal upheaval in our district to go to one learning platform. I took it on the chin." Participant 1 employed communication to avoiding conflict:

> What's most important is understanding the why; why are we doing this and helping the systems, the various stakeholders, to understand the why. I believe, for a leader to be able to both articulate, communicate, and then to have the systems by which other leaders in the system and other leadership groups, be it the school improvement teams that are comprised of, again, an array of stakeholders, including teachers and other members of the faculty, as well as parents and or students having the various groups, be it the parent leadership groups or the other types of professional groups within the district, such as the professional learning groups, the tech committees.

Controversial issues often lead to division. Participant 3 referred to the divisiveness over screen time and the process of deescalating the issue by refocusing:

> We've had board discussions about the amount of screen time that we are asking of our kids. So, that's something that we're battling with now. I would assume that a lot of places are battling with that now. But we're conscious of it, we always have tried to use technology as an additional tool or as a resource and not necessarily the focus of the learning.

Systems, Accountability, and Prioritization (Structural). Implementing technology is inherently reliant upon a well-defined system of planning, management, and execution. The participant responses indicate that leading technology is often applied from the structural frame. Organization, utilization, and prioritization of resources and project management emerged as the essence within this theme. Participant 6 discussed how roles, responsibilities, and accountability are inherent in the implementation process:

> The other issue that comes up a lot with leadership roles is accountability. we had all of our teams structured out on a sheet, and then we would put in the training. Have they completed the training or not? What it lended itself to is some accountability for us to at least track who is where and who has been trained in whatever. And then that turned into our work.

Leading and managing systems as part of implementing technology was part of every participants' response in both the pre-COVID and pandemic-concurrent environments. Participant 1 shared their systemic approach in assessing process and in ensuring accountability:

> We actually use a process for planning that allows for the planning and action and follow-through with regard to a process, and it's a cyclical process that we're working on each year, so that each year we know the steps that we're taking. We're able to monitor and review and assess how far we've gone with those steps and to what degree have they been of added value, or have we met certain targets, and then, what do we need to do for the subsequent year? So, those are really very important processes and systems that we have in place.

The shift from first-order to second order change in terms of P-12 technology, was exemplified in transitioning focus from providing devices, such as in one-to-one programs, to the facilitation and support of instruction and learning (Richardson & Sterrett, 2019). Participant 2 identified their role in this process, "My role is to put everybody's attention where it needs to be put, because they have a certain capacity." Reprioritizing to meet specific needs, Participant 2 shared how they applied leadership through the structural frame to shift resources:

> I'll say, "I can do that, I just want you to know that it's going to take away from the other things that you really want me to do. So, you have to decide, what do you really want me doing?"

All of the participants described the process of creating teams and structures associated with the implementation process. Three of the participants mentioned individuals empowered with specific roles and responsibilities such as directing professional development activities, instructional leadership, and technical direction.

In addition to leading prioritization efforts, all of the superintendent participants discussed the value and importance associated with developing and applying leadership through a strategic plan. Although not expressly mentioned, each participant attributed their strategic planning development and process in terms of coherence (Fullan, 2003). Participant 1 explained:

> So, when we went to move to the fact that one-to-one was going to be an important part of the framework, both the strategic plan, the technology plan, the professional learning plan, and certainly the delivery of curriculum instruction, all

that to work really in sync with each other, and then our budget had to support the alignment with those resources.

Shared Vision, Communication, and Buy-In (Symbolic Frame). The last theme emerging from the data was an aggregate of sub-themes. Shared vision, communication, and buy-in were, collectively, the most common among all the participants in responding to general questions regarding the application of leadership when implementing technology. Each participant specifically identified effective communication as a critical factor in acquiring stakeholder buy-in. Symbolic leaders are those who can charismatically and effectively communicate and convey a vision or message (Bolman & Deal, 2017). Throughout the interview process, the superintendent participants referred to communication and buy-in as essential in the implementation process. Those who referred to communication also described a multi-framed approach where the process, planning, and structure of communication were integral to the message itself. Participant 2 described the importance of planning communication and the crafting of the message to ensure buy-in, "So, communication planning is a big deal. I'm communicating with the board, and I'm making sure that they're with me on whatever we're doing. But I'm also clear with the board, this is a decision." Participant 2 further added how communication was used to engage stakeholders in the process, "I want to engage them, the strategy there is I need to know that they're behind me, and that I'm not going to be stepping out, making a decision that my board can't get behind." Engaging stakeholders and having them buy-in to the concept of integrating and implementing technology was described by Participant 5 in terms of culture:

> But what culture to me, really, is it's not the donuts that you bring in, it's the follow through, it's the buy-in. I think having something that people can see how it fits into the vision long-term to improve instruction.

Participant 7 shared how they encouraged stakeholder buy-in through shared vision development. Communicating the "why" contributed to stakeholder buy-in (Sinek, 2009): "And I think any time that you, as a leader, expect someone to buy into something, it's important that you buy into it as well, and then communicate the importance of it. The why is huge."

All the participants referred to setting or facilitating the vision as an important factor in their role as superintendent, which was on line with both the ISTE (2021) and the NPBEA (2015) standards as well as much of the research in technology implementation (Hitt & Tucker, 2016; Richardson & Sterrett, 2019). Participant 5 characterized their leadership style by establishing and facilitating a shared vision:

> My leadership style has been to work together in collaboration to design a goal or a vision, and then build capacity within the team to carry out that initiative. I think it's setting the vision, it's providing the support, and getting out of the way and being behind with that net to catch them if they need it.

Summary

Although the superintendents applied leadership from each frame, all used a multi-framed approach when implementing technology. Multi-framing is defined as applying two or more frames to meet organizational challenges (Bolman & Deal, 1997). Organizations generally operate through the structural frame and focus less on the others. However, leading change necessitates the combination of all four. Bolman and Deal

(2017) suggested that the human resources frame often becomes an afterthought to structural shifts or changes.

The onset of the COVID pandemic and the shift toward remote learning meant that school districts would need to provide resources and instruction in order to preserve continuity of learning. The New York State Center for School Health (2021) identifies continuity of learning as: "the continuation of education in the event of a prolonged school closure or absence" (p.1). In an effort to meet the parameters associated with the definition of continuity of learning during the pandemic, the school leaders were challenged to provide remote or online instruction for all students. Where one-to-one implementation was once slow, methodical, and structured processes, they now became an urgent necessity.

Research Question 2

The second research question sought to understand how the application of superintendent leadership, when implementing technology, changed in the wake of the pandemic: *In consideration of their perception of leadership, how have school district superintendents' practices or methodologies changed in response to the COVID-19 crisis within the context of technology implementation?*

The onset of COVID-19 meant that superintendents had to shift their practice to meet the associated challenges. Interview questions regarding leadership practices during the crisis sought to build an understanding as to how the superintendents perceived their actions or methods may have changed as a result. Common themes from general questions regarding the application of technology leadership included relationship synergy, conflict resolution, systems, accountability and prioritization, shared

mission/vision, and buy-in. Although all the respondents applied leadership from a multi-framed approach, the predominant theme associated with the first research question was communicating a shared vision to elicit stakeholder buy-in.

Netolicky (2020) noted that school leaders balance their role through a multi-framed approach by leading both fast and slow. They are called to align strategy with operations and make leadership decisions acknowledging and understanding the potential impact. Additionally, as in the case of the participant superintendents, knowing and enacting best practices as external factors, such as the pandemic combined with internal factors, presented unique and unparalleled challenges.

Recent studies suggest that challenges faced by superintendents when implementing and supporting the integration of P-12 technology just prior to the onset of the pandemic include meeting the needs of their stakeholders, supporting professional development, fostering mindset changes, and addressing stakeholder fears (Richardson & Sterrett, 2019). Where previous challenges were more aligned with first-order change, such as ensuring infrastructure was adequate and appropriate devices were available, the most recent research indicates a shift or second-order change toward instruction and learning (McLeod et al., 2015; Richardson & Sterrett, 2018).

The second research question explored changes in the application of leadership as a result of the pandemic and sought to discover potential shifts in the multi-framed approach. Themes were associated with all four of Bolman and Deal's (2017) frames; however, the data suggest a tendency toward the structural frame in response to the crisis. The themes that emerged for Research Question 2 include capacity building, stakeholder empowerment, goal setting, shared vision, lead and facilitate change, parent partnerships,

proactive professional development, and reevaluate the role of technology. Table 4.2 structurally summarizes the categories, themes and essences emerging from the interviews.

Table 4.2

Perceived Application of Technology Implementation Leadership During the COVID-19 Pandemic

Category	Theme	Essence
Structural	Capacity building for crisis	Equity and access – Foundational – Maslow
		Proactive strategic planning – Like a crisis
Human resources	Empowerment	It's about people
Symbolic	Shared vision	Communicate, communicate, communicate
		Engage – the "Why" and the "WE"

Capacity Building (Structural). Capacity building is described as the development of individual and organizational skills, competencies, and dispositions (Fullan, 2013), and it is recognized as an essential factor in the process of organizational change (Dinham, et al, 2011). In times of crisis, organizations tend to focus priorities and reallocate resources to where they are most needed (Johnson & Murray, 2021). Applying leadership practices from the structural frame emphasizes strategy, goals, deadlines, responsibilities, and roles. In their role as superintendent, the participants' shift toward an urgent yet goal-oriented and methodical approach in building capacity was evident. When faced with the urgent need to provide devices for students at the onset of the pandemic, Participant 3 noted the importance of funding as part of the districts' strategy: "So, what we did was we looked at, first off, do we have the money? We did. Sitting there on the

shelf was the roughly $4.6 million in Smart Schools bond money that we knew that we had." Participant 3 further characterized the critical nature of instructional technology during the pandemic: "So, technology is the very heartbeat right now, keeping us going." Participant 1 also referred to budgetary concerns as part of their strategy:

> Our budget had to support the alignment with those resources. The state came out with the Smart Bond Act along the way, and we immediately had a plan that could now be funded by another source of revenue that we could begin to dedicate both hardware and associated software applications [that] were mentioned repeatedly. Acquisition, dissemination, and support of devices and internet connectivity were threaded throughout the responses.

Participant 3 added:

> But the more important thing is the sustainability to say, "okay, when these Chromebooks are done, that next batch, we need to make sure we have those Chromebooks ready to go. We need to make sure the software is on them." Everything that the teachers need, that we have.

Participant 4 shared their team approach to dissemination based on grade level:

> However, we're also looking at our Chromebook and iPad distribution. We use iPads, pre-K and one, and then we use Chromebooks two through 12. So, I have put a team together to say, "where have we decided that, by third grade, students now have to have a Chromebook and why can't a Chromebook be used by kindergartner?"

Participant 6 summarized the collective perspective of all seven participants in terms of building capacity in the form of allocating the right personnel, leading targeted professional development, and ensuring access and equity for remote learning resources:

> We have many families that didn't have stable internet connections, didn't have . . . . Had things that were challenges. So, we have a director of technology, and a lot of our work there has been, "listen, whatever things you can put in households or put in families' hands, whatever support you can give to them, let's do that."

Empowerment (Human Resources). In addition to capacity building, each participant discussed empowerment from both the structural and human resources frame. To some extent, empowerment also emerged in areas most associated with the symbolic frame where district identity emerged in context with their brand or story. Shared and distributed leadership emerged as commonalities in response to providing professional development and building capacity (Avidov-Ungar, 2017). Participant 6 described the application of leadership through empowerment and the distributed leadership model:

> I keep using his name, but he's a powerhouse here. He's not only incredibly intelligent, but I have the expectation from him that he's going to give input on things totally unrelated to technology. I just think it helps people to do their job better when they feel like they're part of that decision process.

Participant 1 used a multi-framed structural and human resource approach to build capacity by facilitating professional development and changing mindsets by empowering the right person with the appropriate interpersonal skills:

> Our instructional technology coach is outstanding. And if I could put nine more of her in the budget, I would. Because she has done a great deal helping teachers feel

comfortable with some of the things we've asked them to do. At the beginning of this pandemic, last March, there were some teachers that might check their email and that was about it.

Fullan (2013) suggested that the right focus within the structural frame will assist in the facilitation of an implementation process. Focusing on capacity building, group quality, systemic coherence, and instruction will provide the desired results rather than accountability or individualism. The urgency associated with a crisis brings problem-solving into focus. Participant 6 brought a team empowerment approach to problem-solving the shift to remote learning (Johnson & Murray, 2021):

> We are going to come to full consensus in this room. And once we reach consensus, we're going to move forward from that point. We came back together, a lot of tension, a lot of anxiety, a lot of dialogue around, what about this, what about that? And we came back together as a team on the second day, we worked it out even more. At noon on that day, we came into the room all as one whole.

Shared Vision (Symbolic). Leading and articulating a district's vision is noted throughout the literature as a fundamental skill needed to affect change. Sharing the vision is not, by itself, an integral part of the symbolic frame. However, rituals, connections with the past, and alignment with organizational heroes characterize this frame. The tenets of the symbolic frame often keep individuals routed in the past and entrenched in the way processes have always been completed. Or, what is more commonly described as, "It's the way we've always done things" (Bolman & Deal, 2003). Crafting new rituals and prescribing new meaning through a crisis is essentially second-order change (Johnson & Murray, 2021).

The participants in the study discussed a shared vision within the context of the crisis and facilitating the process through consistent communication. As with most responses, the participants applied leadership through a multi-framed approach. The structural frame was applied in the organization and in the methodology of communication, whereas the message appealed to the stakeholders' connection to the organization. Participant 4 shared that they regularly referred to the community and made reference to their common struggle through the crisis. Additionally, references to past hardships where the community came together in response was part of the communication process and served as the catalyst to ensure equity and access for digital resources.

Engaging stakeholders at the onset of the pandemic was described as a means to focus community efforts. Additionally, the participants posited that communicating the reasons why decisions were made, helped in engaging stakeholders in the change or implementation process. Participant 1 referred to communicating the why as an integral part engagement process: "So, getting to the 'why' is one of the major factors, I believe, for a leader to be able to both articulate and communicate.

Key Findings

The purpose of employing qualitative descriptive design was to explore, understand, and describe how superintendents perceived their application of leadership within the noted context. The introduction of the COVID-19 pandemic provided an opportunity to further explore the phenomenon. For example, respondents did not offer insight that would suggest applying leadership from the political frame as a result of the

pandemic. However, most responses indicate reliance upon a multi-framed approach predicated on circumstances requiring change. Participant 4 explains:

> Prior to the pandemic, I would focus on fostering our shared vision. I was the main communicator and messenger. My team would organize and really decide which technology and how we would the proposed new tools. Once the pandemic hit, I felt the urgency to focus on our immediate needs. We needed to make sure our students had everything they needed to continue learning and I took the lead role.

Participant 4 further notes that although their role became more focused as a result of the pandemic, maintaining leadership in facilitating a shared vision continued. The transition toward a focused approach to providing needed resources; a shift from the symbolic to structural frames, was shared by several respondents. As an example, Participant 3 characterizes the shift during the pandemic between a structural approach and symbolic:

> I made certain that everything we needed was already in place. That was my first concern. Did we have everything needed to continue learning. I worked with my team to ensure that everyone had their roles assigned and we could move ahead. My job was then to inform our community and share the plan.

The responses indicate a rapid trend toward reframing or frame breaking as a result of the crisis (Bolman & Deal, 2015). Interview questions directed toward the application of leadership during the pandemic also suggest a shift in the application of leadership from activities such as sharing a vision to more foundational concerns. Each respondent referred to their primary role at the onset of the pandemic by ensuring that their students and staff were provided with sufficient resources to continue learning. Participant 1:

> We were already 1:1 so our next concern was bandwidth.

Participant 2 added:

> I made sure that all of our students had chrome books. Thankfully our order arrived just before COVID shut us down.

Participant 4 stated:

> We were very concerned that a significant percentage of our students wouldn't have adequate access to the internet. That kept me up at night.

Summary of Results

The purpose of this qualitative descriptive study was to describe how upstate New York superintendent leadership in technology implementation was approached and applied in P-12 school districts during the COVID-19 crisis. The topic was examined through a practitioner's lens incorporating open-ended inquiry. Eight themes emerged from the seven participant superintendents' responses through the four-frames framework (Bolman & Deal, 1991). The four frames: human resources, political, symbolic, and structural served as categories and a lens through which the researcher viewed the application of the superintendents' leadership before and after the pandemic. Additional themes emerged that can be utilized for future research.

The goal of this research was to add to the body of literature in applying superintendent leadership when implementing P-12 technology. The primary construct of most of the interviews centered around leading a response as a result of the COVID pandemic. Interpretation of the data was conducted through a practitioner's lens, which served as both a challenge and benefit.

Chapter 5 considers the meaning of the data collected and helps form perspectives regarding the importance of the findings. In addition to providing perspective, suggestions for further research and limitations of this study are reviewed.

Chapter 5: Discussion

Introduction

The findings describe how school district superintendents in upstate New York perceived their application of leadership in implementing technology both before and concurrent to the COVID-19 pandemic. Technology proved essential in providing the means and access to educational resources and instruction during a period in which schools across the country were unable to continue in-person instruction. The P-12 superintendent participants provided descriptions, perceptions, and observations about the requirements and characteristics of their perceived and applied leadership with respect to technology implementation. Additionally, although three decades of research exists exploring P-12 technology implementation, a relevant and significant gap exists in the application of leadership at the superintendent level.

The study confirms that superintendents perceive their leadership application as multi-framed as described by Bolman and Deal (1991), however, their responses paint a more holistic picture of the challenges, experiences and potential outcomes that emerged as a result of the pandemic. While the interview process confirmed challenges noted in previous research, the introduction of the pandemic offered perspective that each considered in understanding future practice and in the potential of transforming leadership within the P-12 technology domain. For example, the respondents identified the prioritization of basic needs as foundational as students and staff transitioned to remote learning. If an analogy were to be considered, the foundation of Maslow's (1943)

hierarchy of needs would place an internet capable device and an adequate connection at the very base of the pyramid.

Furthermore, the study indicates a contextual implication in the perceived application of leadership frames that suggests an orientation or predisposition toward the structural frame in the implementation of P-12 technology. Therefore, the introduction of a specific contextual element, such as the implementation of technology serves an opportunity to learn, practice and apply leadership from a multi-framed approach. Additionally, although the application of the political frame was evident with the onset of the pandemic, its was perceived as less useful and significant in meeting associated challenges.

Lastly, this study was guided by the following research questions:

1. How do school district superintendents believe or perceive they are applying leadership practices in implementing district-wide technology?
2. In consideration of their perception of leadership, how have school district superintendents' practices or methodologies changed in response to the COVID-19 crisis within the context of technology implementation?

Key Findings and Implications

As a result of the semi-structured interviews with seven upstate New York P-12 school superintendents, eight themes, within the framework provided through Bolman and Deal's (2017) four frames model, emerged from this qualitative descriptive study, which considered the application of superintendent leadership in implementing P-12 technology both before and concurrent to the pandemic. A series of open-ended interview questions were utilized to discover how the participants' leadership was applied within

the noted context. The first research question sought to explore foundational P-12 technology implementation leadership approaches that were not predicated upon the introduction of a crisis such as COVID-19. In response to the first series of questions, four themes emerged within the four-frames structure: relationship synergy (human resources), conflict resolution (political), systems accountability and prioritization (structural), and shared vision and buy-in (symbolic). Although each theme fits within a specified frame, all of the respondents perceived their application of leadership as multi-framed and situational. Additionally, what emerged from the interviews was the sudden reframing or frame breaking as a result of the onset of the pandemic and the subsequent shift toward remote learning.

The study further explored how the urgency associated with a crisis, such as the pandemic, influences leadership in the noted context, and how shifts in approach may inform future practice. Recognizing that school district leaders, such as superintendents, are critically important in the successful implementation and integration of technology in schools and in the overall success of their students (Marzano et. al., 2006; Sauers et. al., 2014). With the introduction of a crisis such as the COVID-19 pandemic and the associated urgency in transitioning to remote instruction, understanding how leadership skills were applied under these conditions may serve to inform future practice and related research.

Changing Mindsets-Human Resource

Changing mindsets and allaying fear by developing and facilitating interpersonal relationships was identified as a common leadership approach by all the respondents and suggests an orientation toward applying leadership through the human resource frame.

This fits well with Richardson and Starrett's (2019) findings indicating that these were persistent challenges faced by superintendents leading technology as a result of the persistent fear of change and is also consistent with previous research indicating superintendent's tendency toward applying leadership from the human resource frame (Harlow, 1994). The respondents emphasized the relationships they developed and fostered, as well as the ability to identify and empower others within the organization who have the interpersonal skills to assist with such transitions. Having the "right person" was equated by three of the respondents as an individual who possessed both technical and interpersonal skills commensurate with the challenge, and as someone who was also described as having earned the trust of their peers. The importance of trust in transforming organizations, and empowering the right individuals adds predictability to the change process is consistent with previous research (Bennis & Nanus,1997).

The respondents recognized and shared that prior to the onset of the pandemic, limiting fear as a barrier involved modeling use of technology, identifying a tech-savvy facilitator, ensuring the availability of technology and support resources, appropriating effective professional development and facilitating stakeholder involvement. The immediate and urgent transition to remote learning was seen to have reprioritized various aspects associated with the application of P-12 technology and reemphasized the need to build capacity both during and beyond the pandemic.

Additionally, the superintendents interviewed described their reactions to the transformational shift toward remote learning as having the effect of diminishing or effectively eliminating barriers associated with the fear of adopting or implementing technology. Whereas previous studies indicated fear as a barrier (McLeod et.al., 2015),

the covid-19 crisis was perceived to have refocused or reprioritized the process. The acceleration of innovation in time of crisis is not without precedence, and lessons learned from the experience may help in informing future practice. Although it is impractical to suggest that a crisis be introduced to meet organizational goals, understanding how the reallocating of resources and refocusing enabled the process to come to fruition, may assist in building organizational capacity.

Building Capacity-Structural

Throughout the interview process, the superintendents perceived their application of technology leadership as primarily structural, characterized by planning, strategizing, allocating resources, and accountability. Responses were in line with Fullan's (2016) coherence framework and are consistent with previous findings of Cole and Sauers (2018) and Dexter (2104), suggesting the continued need to apply structure in order to maintain coherence throughout the process. Leading technology implementations was perceived as a process involving a strategic plan with specified roles, goals, and outcomes in which the superintendent is most effective in proactively preparing and building capacity. Although technology leadership was perceived and experienced as primarily structural, references and experiences associated with the pandemic suggests application from a multi-framed perspective with emphasis in both the structural and human resources frames (Bolman & Deal, 1997).

The onset of the pandemic was experienced as an opportunity and challenge to reprioritize and reevaluate the capacity to facilitate and engage learning through technology. As a result, the district leaders interviewed, reflected positively on their own preparedness and offered insight regarding potential opportunities for the future.

Understanding and reassessing capacity building in P-12 technology emerged as part of the shared experience and served as a common theme throughout the interview process. Pre and concurrent-pandemic commonalities such as stakeholder engagement and empowerment remain consistent with previous research and were often referred to as essential factors as the crisis developed (Avidor-Ungar, 2018; Davis, 2010; Waters et.al, 2006). Empowering individuals with specialized skills in the key areas of professional development, infrastructure, and communications is a shared experience which positively influenced the transition, and materially assisted in providing both management and leadership within their organizations.

In addition to building capacity through the empowerment of skilled individuals within the organization, the participants' experiences were consistent with standards provided through ISTE (2021) as well decades of associated research. Although each shared their perceived readiness in the wake of the pandemic, all recognized the potential limitations associated with access to digital resources and expressed their related concerns and considerations for future preparedness. Recognizing that as of Fall, 2020, 8% of students in New York State lack access to an internet capable device for home use, with 6% of students reporting no or insufficient home internet access, building capacity for P-12 technology is foundationally predicated upon digital equity and access. Prior to the pandemic, attempts to implement one-to-one programs was a strategic, methodical, multi-year undertaking which often resulted in failure for reasons previously noted such as stakeholder fear of change or lack of available resources (Johnson, 2008; Lamb, et al., 2018). With the onset of the pandemic school districts were forced to adopt remote

instruction providing the urgency and focus required to implement these programs which prioritize digital equity and access.

The superintendents interviewed also consistently suggested the potential of maintaining some version of remote instruction post-pandemic. However, most were reticent and apprehensive in encouraging, adopting or supporting this modality without the benefit further research. When asked how P-12 education might change or transition as a result of lessons learned from the crisis, several acknowledged that certain students were perceived to prefer and thrive in a remote learning environment. In addition to reaching and engaging students who struggle in a traditional learning environment, remote instruction offers the potential of providing a self-paced and personalized learning experience that transcends the status quo. As technology continues to develop in parallel with instructional adaptation, the need for a personalized learning experience will correspondingly increase. As we gain a better understanding of learning, social and emotional impacts associated with remote or online instruction, building capacity to support and sustain this modality will be essential.

Communication-Sharing the Vision-Symbolic and Structural

Providing visionary leadership in facilitating transformational learning opportunities through the use of digital resources such as remote learning, may prove essential in transitioning the P-12 instructional landscape. Sharing and communicating that vision may have also found new routes, methods and venues as a result of the COVID-19 experience. With the predominant use of online video conferencing tools such as Zoom and Google Meet during the pandemic, school districts, businesses and other organizations have become accustom to gathering digitally. The participants each shared

their related experiences and provided a general sense that at least to some degree, the practice would continue as attendance in parent forums, board meetings and other similar gatherings notably increased. Considering the relative ease of communicating and gathering digitally, involving and engaging stakeholders should prove less of a barrier in leading or sharing a vision for future implementations.

Facilitating a shared vision still remained a consistent theme despite the crisis however, the message transitioned to a singular focus centered around providing families with necessities and information relative to the experience. As noted in previous research, modeling the use of technology by superintendents serves to belay fears and was identified as a means to lead by example (McLeod, et al., 2015). As the pandemic unfolded, the participants each shared their experiences in digitally communicating with stakeholders in ways that they had not used previously. Modeling the use of video conferencing tools and maximizing the use of communication applications provided consistency and commonality in messaging and served to lead others apprehensive in using such tools. Additionally, each of the respondents referred to their respective school districts in the collective "we" and reiterated the importance of involving the entire community in a common purpose.

As previously stated, all of the respondents perceived their approach to leadership as multi-framed (Bolman & Deal, 1991). As an example, applying leadership from the structural and human resource frames was used as a method to belay fears and elicit stakeholder buy-in. Additionally, sharing a common vision through consistent methods of communication was part of each respondent's recognized responsibility and was noted as a key element in leading change. The planning, facilitation, and execution of

communication was noted as part of all the respondents' strategic plans, yet the message and call for community unity of purpose and vision served as an application of the symbolic frame.

Leading Technology in Crisis-Political and Multi-Framed

Prior to the onset of the pandemic, the introduction of new technology would often trigger debate, disagreement and division amongst various district stakeholder groups. Citing research indicating mixed results from various implementations and concerns over issues such as screen time and cyber-ethics, communities have historically struggled to adopt such programs. The participants in this study recognized and experienced the conflict associated with introducing technology yet contributed most of the relative upheaval to the unavoidable affects associated with change. As each superintendent adopted new technologies or programs, they followed similar yet nuanced methods of leading stakeholders by engaging, communicating and modeling in order to see their vision through to fruition and in each case, clarified the importance of conveying, as Sinek (2009) notes, the "why".

Perhaps one of the more interesting findings that emerged from this study, was the relative absence of conflict associated with technology during the pandemic transition. Though each respondent shared insight regarding their past experiences in introducing or changing programs, the crisis seems to have brought both unity of purpose and relative acceptance. Although seemingly counterintuitive, solidarity during crisis is well documented in research (Lindell, et al, 2006) and likely a contributing facture in the perceived application of the political frame during the pandemic. How this might translate beyond the pandemic and in terms of technology remains to be seen. However,

competing interests, politics and power struggles are likely to return given the less heightened nature of a post-pandemic society.

The next two sections in Chapter 5 discuss the limitations of this study, suggestions for future research, and recommendations for future practice.

Delimitations, Limitations and Opportunities for Future Research

A qualitative descriptive study is a comprehensive summary of events as they are experienced by individuals or groups. While qualitative descriptive research provides a view of the moment, it is not intended to result in theory (Lambert & Lambert, 2012). Additionally, the timing of this study presents inherent limitations since interviews were conducted in the midst of a pandemic. The delimitations were designed as part of the study including the length of time allocated to conduct interviews which resulted in seven school district superintendents. These participants represented seven of the 42 upstate New York school districts within the area sampled. Broadening the scope of the research may prove valuable. Additionally, the researcher is a colleague and practitioner working in the field. Although all ethical guidelines were followed, respondents may have been reticent regarding their predisposition and perceived inequities in comparison to other colleagues or school districts.

The limited time and scope of the study presents opportunities for further research in understanding the application of leadership within this domain. In particular, several topics may be considered for further exploration such as; (a) leading the implementation process during the crisis, (b) understanding and maximizing instructional technology professional development efforts during the pandemic, (c) identifying the impact of remote learning and teaching, (d) student attendance and engagement in the remote

learning environment, (e) superintendent community engagement and leadership. Research in these areas could help guide the potential transformation of the P-12 landscape post-pandemic and may help in informing leadership and educational programming.

Recommendations

The superintendents who participated in this study represent a leadership cadre that is currently applying their knowledge and skills during an exceptionally difficult time. The recommendations from this study build upon their experience, leadership, and actions in response to the pandemic and in conjunction with the research questions. Given that historically, rapid developments following crisis has inspired innovation in science, technology, production and social constructs, the same transformational process may emerge in P-12 education (Field, 2003; Gross & Sampata, 2020). Similarly, the COVID-19 pandemic may provide for a tragic, yet convenient catalyst in transforming learning by offering students technology facilitated options that previously unavailable or unsupported. Although most respondents identified in-person instruction as the preferred method, each recognized the potential associated with the transition to remote learning. More specifically, they emphasized the value and possibilities associated with remote instruction and contemplated the realities of extending learning beyond the traditional classroom.

The urgent shift to remote learning presented school districts with significant challenges. How district leaders responded to these challenges may help inform practice and provide insight regarding future implementations. For example, urgency culminating in clarity of purpose emerged as a result of the pandemic. The clarity in purpose and

singular focus imposed by the pandemic provided enough reason to potentially shift mindsets or lesson fears associated with the adoption of instructional technology. Fear and reluctance to adopt technology has served as a consistent hinderance despite decades of reliance on innovation. As newer cadres of teachers enter the workforce, particularly those that have been immersed in the technologies of the 21st century, fear of adopting new innovations may subside. However, if past experience is a true indication of future endeavors, the very onset of change itself will remain a barrier. The superintendents who participated in this study offered valuable insight in leading their communities through both technological change as well as a crisis. As they begin to share their collective experiences through the pandemic, their knowledge, leadership and expertise can and should inform future leaders and related practice.

Lastly, the crisis brings to the forefront the inequities that exist in making 21st century learning tools available for all students. This study examined and provided some insight regarding the application of technology leadership during a crisis. However, the need to ensure and provide digital equity remained a consistent theme throughout. In addition to ensuring that communities are engaged, informed and involved, districts must have access to the resources necessary to effectively instruct. Whereas all acknowledge the tragedies associated with the pandemic, it was also recognized that it brought to light both inequity and conversely, the ability of communities to mobilize.

Conclusion

Qualitative descriptive research adds depth to knowledge and can assist the development of new practice. The descriptions provided by the superintendents who participated in this study deepens understanding of the experience and comprehensively

summarizes the event in common terms (Sandelowski, 2000). The experiences provided by superintendents during the COVID-19 pandemic offers opportunities to consider and explore their application of P-12 technology leadership during an unprecedented.

Key findings were presented in Chapter 5 including recommendations, implications, limitations and opportunities for future research. The goal of this study was to understand how seven school district superintendents in upstate New York perceived their application of P-12 technology leadership during the COVID-19 pandemic. Bolman and Deal's (1997) four frames leadership model was used as a lens to analyze the data and as a way to help provide a framework and structure for the study. Open-ended interviews were conducted providing an opportunity to more deeply explore the challenges and opportunities associated with their experiences during this unprecedented time.

The findings from this qualitative descriptive study suggest that each of the participant superintendents noted a shift in priorities, focus and application of leadership in response to the pandemic. Johnson and Murray (2021) noted that crisis instills a sense of urgency, an organizational focus on priorities, reallocation of resources to meet the challenge, and perspectives that result in second-order change. Each participant reiterated, reinforced, and applied technology leadership in congruence with standards (ISTE, 2021) and research (Dexter, 2014; McLeod et al., 2015), yet also provided insight through their experience that may serve to inform future practice.

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Appendix A

Introduction Letter

Appendix B

Interview Preceding Notice

The purpose of this study is to identify, understand, and learn how school district superintendents believe they are applying leadership practices in implementing district-wide technology. Also, in consideration of their perception of leadership, has their practices or methodologies changed in response to the COVID-19 crisis within the context of technology implementations? This interview will be recorded. This interview is voluntary thus you may decline to answer any question throughout the process. All participants are anonymous, therefore, names will not appear in any of the associated study documentation. I am going to proceed with the interview: If, during the process of interviewing, you would like to stop or simply pause, please let me know.

Appendix C

Interview Questions

1. Would you discuss your experience with technology as it relates to your role as superintendent?
2. Please consider and explain your concept and understanding of the role of technology in P-12 education.
3. How might you define or describe your leadership method or style in implementing technology?
4. In reflecting upon past technology implementations, prior to the COVID-19 crisis, in what ways have you applied leadership.
5. Please characterize or describe what you feel are important or essential factors in leading district-wide technology implementations? Why are these factors important?
6. In your role as superintendent, how might you assess progress in all phases of an implementation? Accountability?
7. How has the COVID-19 crisis changed the approach to technology and the implementation of technology for your district?
8. How has the COVID-19 crisis changed your application of technology leadership?
9. Do you agree with the statement that "technology leadership is just good leadership?" Why or Why not?
10. Please describe any potential related outcomes in P-12 technology you feel may arise as a result of the COVID-19 crisis.

11. How might school district technology leadership preparation better inform future superintendent's as a result of your experience both pre and post COVID-19?

Appendix D

IRB Approval Letter

ST. JOHN FISHER COLLEGE

November 23, 2020

File No: 4141-11192020-04

Dominick Lisi
St. John Fisher College

Dear Dominick:

Thank you for submitting your research proposal to the Institutional Review Board.

I am pleased to inform you that the Board has approved your Exempt Review project, "Leading at the Speed of Learning: Superintendent Leadership in P-12 Technology Implementations in the COVID 19 Era".

Please note, to reduce the spread of COVID-19 and to help mitigate community transmission, St. John Fisher College has temporarily suspended all in-person activities (recruitment and data collection) among researchers and study participants for all IRB-approved human subjects research until further notice. Studies that do not involve any direct subject contact, e.g., pre-existing records, electronic surveys, tele-research, and remote interaction via device/app/software are still permissible, along with data analysis from previously collected in-person sessions.

Should you have any questions about this process or your responsibilities, please contact me at irb@sjfc.edu.

Sincerely,
Eileen Lynd-Balta

Eileen Lynd-Balta, Ph.D.
Chair, Institutional Review Board

ELB: jdr