THE INFLUENCE OF COVID-19 ON CAMPUS LEADERS' ATTITUDES TOWARDS AN ACQUIRED EXPERTISE IN TECHNOLOGY

by

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ABSTRACT

THE INFLUENCE OF COVID-19 ON CAMPUS LEADERS' ATTITUDES TOWARDS AN ACQUIRED EXPERTISE IN TECHNOLOGY

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University of Houston-Clear Lake, 2022

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The purpose of this mixed methods study was to examine the influence of COVID-19 on campus leaders' attitudes towards acquired experience in technology. The research was completed during 2021 with K-12 campus administrators within the state of Texas. A purposeful sample of 171 K-12 campus administrators within the state of Texas completed the *Principal's Computer Technology Survey* (PCTS). Of those, 10 campus leaders participated in the individual interviews. Descriptive statistics, paired t-tests, Wilcoxon signed rank tests, and thematic coding were used to analyze the data collected. Quantitative data demonstrated campus leaders' integration of technology and attitudes towards technology were significantly influenced by COVID-19. The qualitative analysis provided supporting evidence of the importance for campus leaders' experience, knowledge and training in supporting instructional technology integration as necessary to increase teacher and student achievement.

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CHAPTER I:

INTRODUCTION

When campus leaders are asked what their role is in a traditional setting, most will likely respond, ensuring student success. Research indicates that the roles of campus leaders change as they become virtual leaders in supporting teachers (Gigliotti, 2020). Although leadership can look differently in each sector, educational campus leadership is defined as the ability to influence teachers and staff in a way where student success is the priority (Bush, 2018). For the purposes of this study, campus leaders were principals and assistant principals that are directly related to the appraisal of instructional staff. The question left unanswered is: How can campus leaders better prepare themselves to be effective in supporting teachers during their virtual delivery of instruction in a virtual learning platform? The intent of this study was to examine the impact of a pandemic, such as the Coronavirus (COVID-19) on campus leaders in terms of their technology integration, perception of technology, and expertise in technology. This chapter will describe the research problem, the significance, research purpose and questions, and definitions of key terms.

Research Problem

In late spring of 2020, educators, students, and parents around the world felt an extraordinary ripple effect on student learning when schools were closed amid a public health emergency (McCarthy, 2020). The coronavirus (COVID-19) is a disease caused by the virus SARS-CoV-2 discovered in 2019 (Centers for Disease Control and Prevention, 2019). COVID-19 quickly spread around the world and forced educators to replace in-

person, classroom learning with a virtual model. While higher education institutions had been increasing virtual learning opportunities even before the pandemic closed schools, K-12 schools had to quickly adapt to virtual learning (Govindarahan & Srivastava, 2020). District and school leaders scrambled to provide guidance in what became the new normal for the delivery of instruction and learning. The role of campus leadership in supporting teachers during this time varied from school to school (Govindarahan & Srivastava, 2020).

Gigliotti (2020) explains that the pandemic required an immediate response and further complicated the work of campus leaders. There were new concerns related to enrollment, instruction delivery and quality, and the physical, mental, and emotional well-being of the staff and students. During times like those of the pandemic, campus leaders are required to focus on addressing immediate needs while also making decisions that impact their schools long-term. They also state that the changes the pandemic has caused in education are those that have provided an opportunity to revamp strategies and practices used in the classrooms that have positively affected student learning.

There is considerable research regarding factors that influence teachers and campus leaders in technology integration during in-person learning. Some believe attitude toward technology and perception of the importance of technology are two main factors in determining success of technology integration in the classroom (Alward & Phelps, 2019; Claro, Nussbaum, Lopez, & Contardo 2017). Principals with positive attitudes toward technology saw more effective technology integration processes in schools, while principals with indifferent or negative attitudes toward technology saw

little effort by teachers to integrate technology within the classrooms (Claro et al., 2017). This suggests that the success of a teacher in virtual settings relies heavily on the virtual leadership and perspective of the campus leaders. Higher emotional intelligence and communication of technology expectations have a positive relationship with the amount of technology is integrated into the classrooms (Claro et al., 2017).

While campus leaders seem to influence teacher use of technology, some researchers believe the principal's proficiency in technology is the leading influence on a how well a teacher can integrate technology in the classroom (Hero, 2020). Research depicts that the campus leaders' proficiency in technology has a direct positive correlation with efficient technology integration of the teachers on the campus (Dogan, 2018). The more training and support teachers receive, the easier the programs and technology will be to integrate into the classroom (Hero, 2020). Another factor studied is technology self-efficacy (Dogan, 2018; Yost, Conrad, Watkins, Parr, & Gordon, 2019). Principals and assistant principals participated in a study that indicated most school campus leaders have a high level of self-efficacy perceptions of technological leadership (Dogan, 2018). In contrast, Yost et al. (2019) found that although leaders on campus are expected to be proficient in technology, many feel unprepared as virtual leaders, unable to support the staff during virtual learning. This might leave researchers to believe that although campus leaders feel they are proficient in technology, they do not feel they are proficient enough to support others in their acquired expertise in technology.

Lastly, researchers have concluded that a teacher's use of technology affects how well technology will be integrated within the classroom (Tatlı, İpek Akbulut, & Altınışık,

2019). Research in this area is expected to grow as the use of smart phones and technology continues to evolve (Tatlı et al., 2019). One way that teachers can become more proficient in integrating technology is in using and being comfortable with using different types of technology. Professional development and training are important in supporting teachers in learning the different ways they can integrate technology in the classroom (Hero, 2020). Understanding the relationship between the different factors that influence campus leaders is crucial to our education system. As campus leaders transition back to in-person learning, schools have the opportunity to rethink and implement changes in the education system that can focus on student learning in any environment (Whalen, 2020). As contingency plans that address student remote or virtual learning are being created, the hope is that the Coronavirus (COVID-19) reveals the weaknesses and need for lasting changes to the way districts and schools address student needs. Furthermore, campus leaders must strive to recognize their roles during virtual learning and use their influence to increase the effectiveness of teachers. Before they use their influence, they must understand what and how factors influence their behavior and decision making regarding virtual instruction and the effects of COVID-19 on the instructional and support roles of campus leaders during virtual learning.

Significance of Study

The K-12 education system is ever evolving (Ball, 2021; Keating, Harrison Jr., Dauenhauer, & Lambdin, 2010; Meyer & Rowan, 2006). This is in part due to the advances in theory and research, reflected in the study of educational strategies and best practices that maximize instruction and student learning (Meyer & Rowan, 2006). Ball

(2021) sought to explain why education policy changes occur in the book and concluded that most recently, politicians seek to correct unequal education achievement between students. Changes have been observed since before 1976, at the beginning of progressivism and comprehensivism in education (Gray & Whitty, 2007). In their review of literature, the researchers found that the different types of schooling were affected by policy makers desire to address issues of social inequality and the desire for raising standards within schools to better educational outcomes. In their study, Keating, Harrison Jr., Dauenhauer, and Lambdin (2006) found that education systems change in response to the need for improvement, a charge placed on policy makers, although many do not have a firm grasp of effective educational programs.

While once reserved for higher education, virtual instruction is becoming more prevalent in K-12 settings (Schroeder, 2019). Harasim (2000) explained that the invention of the World Wide Web in 1992 made virtual education more accessible. He predicted technology would alter global civilization as educators and learners adopted and adapted virtual collaborative learning. Their research depicts virtual technology has increased access to education and the number of opportunities for students, such as full-time working parents, who need virtual learning options. It is important to recognize the role of a campus leader in the different modes of instructional delivery for education and learning, a role that evolved as education changes and student learning transforms over time (Cruz-Gonzalez, Rodriguez, & Segovia, 2021). The world-wide pandemic COVID-19 caused a major interruption in students' learning and educators' teaching (Burgess & Sievertsen, 2020). As instruction was forced to move virtually, campus leaders were forced to revisit their roles and become virtual leaders. To provide staff with the support needed to deliver instruction virtually, there is a need for this study to examine effects of

COVID-19 and the impact it has had on how campus leaders have changed in their integration, perception, and expertise in technology.

Research Purpose and Questions

The purpose of this study was to examine the influence of COVID-19 on campus leaders' attitudes towards acquired experience in technology. The study addressed the following research questions:

R1: Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 curriculum integration?

Ha: There is a statistically significant mean difference between a campus leader's pre and post COVID-19 curriculum integration.

R2: Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 attitudes towards technology?

Ha: There is a statistically significant mean difference between a campus leader's pre and post COVID-19 attitudes towards technology.

R3: Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 acquired expertise?

Ha: There is a statistically significant mean difference between a campus leader's pre, and post COVID-19 acquired expertise.

R5: What are campus leaders' perspectives of how COVID-19 has impacted instruction on their campuses?

Definitions of Key Terms

Acquired Expertise in Technology: Using mobile learning devices for learning that can enhance the accessibility and effectivity of utilization to sources and interaction among students (Shubina & Kulakli, 2019).

Attitude Towards Technology: A person's disposition to respond favorably or unfavorably to a person, object, event, or institution. In this study, a person's disposition towards technology (Ajzen, 1989).

Campus Leaders: Principals and assistant principals that are directly related to the appraisal of instructional staff (Texas Education Agency, 2018).

Coronavirus (COVID-19): An illness caused by a virus that has spread throughout the world and is spread from person to person (Centers for Disease Control and Prevention, 2020).

Integration of Technology: The manner in which an educator chooses to use or include technology into the curriculum or classroom (Thompson, 2021).

Pandemic: A very large widespread occurrence of an infectious disease over a very wide area that affects a large portion of the population (Morens, Folkers, & Fauci, 2009).

Principal's Computer Technology Survey (PCTS): A survey used to examine a principal's role in integrating technology, attitudes towards technology, expertise in technology, and professional development needs to enhance technology skills (Brockmeier, Sermon, & Hope, 2005).

Student Engagement: A student's quality of effort and involvement in productive learning activities that lead to a rich and challenging learning experience (Groccia, 2018).

Technology Proficiency: Having the skills necessary for integrating technology into teaching and learning (Christensen, 2021).

Virtual Learning: Delivery of instruction available on desktops, laptops, phones, and on web browsers that provide the integration, collaboration, education, and communication of instruction or training (Almarzooq, Lopes, & Kochar, 2020).

Conclusion

This chapter laid the framework for the need to examine the impact of COVID-19 on campus leaders' integration of technology, perception of technology, and acquired expertise in technology. Once the significant difference, if any, is determined, it can be used to better train and prepare campus leaders in being more effective leaders as they support teachers and staff during unprecedented times that might require instruction to be delivered virtually. With knowledge of how quickly the education system can change, campus leaders need to take the opportunity to reshape American education and become more prepared in the readiness emergency management of schools (McCarthy, 2020). Chapter two will provide a discussion of the literature relevant to the topic including principals' integration of curriculum and technology, attitudes towards technology, and acquired expertise in technology.

CHAPTER II:

REVIEW OF THE LITERATURE

Schools closed around the world due to the COVID-19 pandemic. The United Nations Educational, Scientific and Cultural Organization estimates that over 290 million students' education was disrupted worldwide (McCarthy, 2020). With educators being forced to deliver instruction virtually during the time mandated social distancing protocols were necessary to protect the health of citizens, district and school leaders scrambled to provide guidance in what became the new normal. The role of campus leadership in supporting teachers during this time varied from school to school. The purpose of this study was to examine the influence of COVID-19 on campus leaders' attitudes towards acquired experience in technology. To address these areas, this literature review focused on campus leaders': (a) integration of technology in curriculum, (b) attitude towards technology, and (c) acquired expertise in technology.

Integration of Technology

Technology integration can vary from campus to campus. The manner in which each campus chooses to integrate technology into the curriculum is greatly determined by campus leaders and how much attention they dedicate to technology integration in the school (Thompson, 2021). Thompson writes that if principals expect faculty and staff to use technology, they should model best practices by using them in professional development, staff meetings, and faculty discussions. The researcher believes that this intentional action demonstrates a consistent and unified approach to technology integration that ultimately provides educational benefits to students. Some researchers

believe that principals have a direct effect on how much technology a teacher integrates in their classroom (Jiang, Nilsen, & Whitaker, 2017; Masibo, 2017; Thannimalai & Raman, 2018; Sterret & Richardson, 2020). Jiang, Nilsen, and Whitaker (2017) studied the impact of different factors on technology integration. The purpose of the study was to examine the contextual factors affecting technology integration in math and science at three schools. The study was conducted at three K-8 schools in Southern California. The majority of the population of students at these schools were military dependent students. The researchers sought to confirm the hypothesis that incorporating technology into the curriculum would yield positive effects on student achievement.

The study was conducted using a qualitative approach. The researchers collected data from interviews, focus groups and observations. The participants for the interviews and focus groups were campus administrators responsible for holding professional development workshops and one-on-one coaching and the teachers receiving the training. These administrators' main job responsibility was to help teachers integrate technology into their instruction. The administrators were interviewed individually, while teachers were interviewed in focus groups. The interviewed were recorded and then transcribed. The transcriptions were coded for themes. The researchers were able to conclude that among other factors, campus leadership affected how much teachers collaborated to meet the individualized technology integration needs at each of the schools. Campuses that received more professional development and training were more likely to integrate technology into their training. Teachers shared that the professional development was decided upon and organized the campus administrators. This would direct future campus

leaders to provide more technology leadership by providing professional development in the areas of technology integration should they want their teachers to integrate more technology in their classrooms.

Masibo (2017) also studied teachers' integration of educational technology in classroom instruction. The purpose of their study was to determine what factors affected teachers in technology integration. The study targeted secondary school teachers in Bungoma County, Kenya. Of those contacted, 298 schoolteachers responded to a questionnaire composed of items examining the factors that affect the integration of technology in instruction and the severity of the identified factors in affecting instruction. The data were analyzed using descriptive statistics involving the mean, frequencies, and percentages. The researcher was able to conclude that although the teachers held different beliefs about the approach for teaching their subject, there were three main causes to poor technology integration within their classroom: lack of resources or materials, lack of teacher preparedness to use technology, and lack of administrative support. Masibo recommended school managers and administrators should support educational technology by providing the means to establish and develop the resources and staff through quality education and training in schools.

One part of technology leadership is the understanding and implementation of technology on campus. The purpose of the study by Thannimalai and Raman (2018) was to identify the principals' technology leadership and the effect it has on teachers integrating technology within their classrooms. The population sampled were principals and teachers from the 158 National Secondary Schools in Kedah. A total of 90 principals

and 12,088 teachers completed the survey. Only those teachers whose principals completed the survey were chosen, leaving the sample at 90 principals and 645 teachers. The principals were almost evenly distributed, with 55.0% being male and 45.0% being female. Most of the principals, 93.3%, were older than 45, and the majority, 87.8% had 10 years of experience or less. The researchers used two different questionnaires. The principals were administered the *Principals Technology Leadership Assessment* (PTLA). The teachers were given the *Learning with ICT instrument.* Each of the surveys was analyzed using the Statistical Package for the Social Sciences (SPSS) 23.0 for descriptive analysis. The SPSS Hayes' Process macro extension was used to measure the relationship between a principals' technology leadership and a teacher's technology integration. Thannimalai and Raman (2018) found that there is a significant relationship between principal technology leadership and teachers' technology integration. When professional development related to technology integration is moderated by campus leaders, teachers tend to integrate more technology in their classrooms.

Professional development is not the only way to support teachers in their effective integration of technology into schools (Christensen, Eichhorn, Prestridge, Petko, Sligte, Baker, Alayyar, & Knezek, 2018) In their review of literature, the researchers focused on the role of campus leaders and their roles in the effective use of technology in the learning environment (Christensen et al., 2018). The purpose of the article was to recognize the characteristics of campus leaders that can ensure technology integration and further improve education systems. The researchers studied the characteristics of learning leaders, effective leadership styles, roles of principals and teachers as leaders for

technology enhanced learning, preparation of campus leaders to enhance learning with technology, innovative models and practices for creating leaders, and assessing leadership impact on technology integration. The review of literature was summarized in the findings that principals who spend more time with their teachers, encouraging technology-enhanced learning seem to have more technology integration on their campuses. The researchers believe that effective campus leaders exhibit the ability to create a shared vision and seek and contribute to the on-going professional development of technology.

Sterret and Richardson (2020) also believe that the role of campus leaders is to support and nurture the growth of teachers. Campus leaders must be collaborative and develop their skills as digital leaders to develop their faculty and staff. These researchers sought to understand how principals use technology to grow as leaders and how they help their teachers grow in terms of technology professional development. The population of the study were "digital principals" recognized by the National Association of Secondary School Principals (NASSP). Of the 18 contacted, 12 principals agreed to participate in the study. The participants varied in years of education from 14 years to 38 years. The data as collected through 60-minute semi-structured interviews consisting of 14 questions. The interviewed were coded three times to find themes. The researchers concluded that the campus leaders seemed to understand their teachers' digital needs and provided purposeful professional development in technology. The campus leaders were engaged in digital professional learning networks, and all saw the importance of empowering their teachers as digital leaders.

As previous research established, campus leaders learn to be technology leaders to influence technology integration on their campuses (Edwards, 2020). In their qualitative study, Edwards investigated how campus leaders learn how to be technology leaders by examining the different ways they learn and the skills they feel they need. The population of the study were principals across school districts in the mid-Atlantic region. The researchers used snowball sampling where principals that were selected to participate and then asked to provide names of other principals that play a role in technology. The sample of the study was 18 principals from 10 different districts across the state. The principals were interviewed either by phone or face-to-face. The years of experience varied from two to eight years. Of the 18 principals, 61.1% were female. The interviewed were semi-structured with standard questions and a few tailored questions for clarification or probing at the end.

The interviews lasted about an hour and were developed to determine how the principals learned to be successful technology leaders and what skills they used in their technology leadership. The interviews were recorded and transcribed. After transcription, the researcher used Quirkos to code the interviews and look for common themes amongst the participants. The interviews provided data to support that principals have four ways they learn: professional development, independently, from others, and from their preparation programs. Most principals placed a greater dependence on professional development in learning how to become technology leaders. Almost all principals stated that they also learned from experience, initiative and reflection. Many stated that their personal experience influenced how they learned and how they led with technology.

District leaders also play a role as technology leaders (Vyas, 2020). Vyas (2020) compared the differences between superintendents and principals in their roles as technology leaders and how they affected technology integration in classrooms. In this

study, the research focused on assessing the differences between district and campus leaders and their roles in implementing change initiatives with a goal of improving technology integration into the curriculum. The population for the study was 240 public school superintendents and principals in the state of State of New York. Of the potential 240 participants, only 23 superintendents and 19 principals responded. The majority were white males aged 35 to 54 years old. The participants were issued two surveys. The first survey was based on Tomei's (2002) Technology Facade Checklist and the second was the Multifactor Leadership Questionnaire. The data were analyzed to explore the relationship between technology integration and leadership style of both types of leaders. The researcher was able to conclude that principals were the leaders that have the biggest influence on the application of technology for learning within a school. Vyas concluded that principals seem to be in the best position to ensure that technology is adopted and implemented on campus because they are more involved in school-based technology planning.

One of the main ways to become more involved in the professional development of their teachers is for campus leaders to plan technology integration and provide professional development in the area of technology (Cilsalar Sagnak & Baran, 2021). This qualitative case study was designed to examine teachers' technology integration behavior and how campus administrators can improve the teaching and learning environment through the use of technology integration. The population for the study was 24 faculty members and 24 graduate students. Of these, 17 faculty members and 17 graduate students participated in the qualitative case study. Their ages ranged from 31 to 49 and all had between two and 22 years of experience in education. Researchers used semi-structured interviews and the mentors' case study reports to examine the factors affecting technology integration. The participants were interviewed individually for

approximately 45 minutes. The interview had two parts: initial background and main questions. Each interview was recorded and transcribed. Once transcribed the interviews were analyzed through coding to find emerging patterns in behavior. After initial coding, the transcripts were uploaded into NVivo for further analysis. The researchers organized the codes and themes to reach their conclusions for the study. The main factors related to teachers' technology integration were behavior, intention, attitude, and subjective norms. The researchers found that campus leaders influenced technology integration for 15 of the 17 faculty members. Eight of the 17 faculty members also mentioned that they felt campus leaders could do more in supporting teachers in technology integration. One stated that if there was more support, motivation to use technology would increase.

Not only does research show that district and campus leaders influence technology integration, but leaders also influence the ways their staff view technology (Dogan, 2018). The views on technology can vary from the perceptions of usefulness to the perception of ease of use of instructional technology for both managerial tasks and curriculum integration. A review of research investigating campus leaders' attitudes towards technology is required to help understand how leaders view technology and the implications of their perception on how their staff accept and use technology in their classrooms.

Attitude Towards Technology

There is research that supports the notion that campus leaders' attitude towards technology influences their ability to provide effective leadership in effectively organizing, utilizing, and implementing technology in schools (Beytekin & Arslan, 2018; Claro, Nussbaum, Lopez, & Contardo 2017; Perkins-Jacobs, 2015). In their study, Perkins-Jacobs investigated how attitudes and perceptions on technology influence and support the mission and vision of administrators using the National Education

Technology Standards for Administrators (NETS-A). Urban high school principals in Arkansas made up the population of the study. Of those contacted, 10 principals were selected because of their experience, diversity, and knowledge about the use of technology in the classroom. Females made up 40% of the participants, while males made up 60%. Sixty percent of the participants identified as African American and 40% identified as White. Their ages ranged from 40 to 64. The participants were each interviewed using a 16-item interview protocol. The interview consisted of five sections: visionary leadership, digital age learning culture, excellence in professional practice, systemic improvement, and digital citizenship. This researcher concluded that apprehension about technology has a negative relationship with how technology is implemented in their campus classrooms and suggested that principals need to get involved with planning and infrastructure to ensure the schools are equipped with technology tools and teachers are trained in how to integrate technology in the subject areas.

Dogan (2018) also researched campus leadership and their attitudes towards technology and how they influence the teachers on their campus. The purpose of the study was to investigate the leadership self-efficacy perceptions of educational managers and how it correlated with technology integration by classroom teachers. The study group consisted of 210 campus leaders, with the majority, 187 being male. More than half of the participants were 41 years of age and older and spent more than 10 years in administration. The data were collected by the researcher using a 48-item survey form that included the *Instructional Technology (IT) Self-Efficacy Perception Scale* and the *Technology Leadership Self-Efficacy Scale.* Dogan concluded that the technological leadership self-perceptions, self-efficacy, and usage of campus leaders were high. This demonstrates that campus leaders are willing and supportive to use technology in

educational processes. There was a significant positive correlation between self-efficacy perception levels of campus leaders and the teachers' effective use of technology and proficiency levels.

There are many similarities and differences between the views of teachers and campus leaders regarding technology integration (Claro et al., 2017). In this study, researchers aimed to study and compare the views of teachers and campus leaders and how it affected implementation of a new technology tool. The population for the study was comprised of 1,591 schools in Chile participating in a new program, Mobile Computer Laboratory. An email with the researcher created questionnaire was emailed to all campus administrators and teachers. Of those contacted, 242 responses were received. Although the study does not share information about the demographics, it alludes to having an equal representation of teachers and campus leaders. Once the participants had answered the questions, they were invited to participate in case studies and interviews. The interviewed were conducted following a set of open-ended questions that examined the attitudes towards technology and implementation of technology of both teachers and campus leaders. The researchers found that campus leaders answered the questions and interviews more broadly, based on the organization, while teachers had a narrower perspective, based on their experience in the classroom. Both teachers and campus leaders agreed that when new technology was adapted in a school, campus leaders had more influence on how much of the technology was integrated.

Teachers believe that campus leaders should support the development of digital culture and the application of technology in the classroom (Beytekin & Arslan, 2018). Beytekin and Arslan (2018) examined the views of teachers and how they were related to campus technology leaders. The purpose of the study was to provide information on how leadership can provide support to teachers as technology continues to change and

develop. The population of the study were teachers in Bornova, Izmir, and Turkey. The sample was 90 teachers who work in the primary schools, as they were most accessible to the researchers. These 90 teachers were instructed to complete the sentence stem, "Technology leaders are like…because…" The metaphors were collected and then arranged through coding. The researchers divided the metaphors into five different categories based on the International Society for Technology in Education (ISTE) standards. The category that contained the most responses fell under systemic improvement (18 metaphors) and visionary leadership (14 metaphors). The participants felt that technology leaders should provide guidance in how to integrate technology and adapt to the changes. The researchers suggested that when wanting to increase technology in the classrooms, teacher development and support should be prioritized.

Similarly, Ugur and Koc (2019) wrote that school administrators that carry out technology implementations should behave as technology leaders. The purpose of their study was to examine campus leaders and discuss how their mission and vision of technology in schools has changed over the years. The population consisted of administrators from high schools in Sakarya, Izmit, and Istanbul. Most of the administrators had more than 10 years' experience. The sample consisted of 10 campus administrators, six males and four females. These administrators ranged from 18 years to 39 years of experience as a principal. The principals were interviewed individually using questions based upon the Technology Standards for School Administrators/International Society for Technology in Education Performance Indicators and Technology Standards for School Administrator Collaborative. All participant administrators believed their teachers should check their e-mails and attend professional development in technology. The principals believed that campus leaders should also participate in technology

professional development to lead the schools. All principals stated that they were aware of the need to stay up to date in the digital age of technology.

Extending research in the acquired expertise in technology beyond managerial tasks, researchers have found that leaders' perceived usefulness and perceived ease of use of technology has a positive relationship with workers' intention to use (Aziz, Rami, Razali, & Mahadi, 2020). The purpose of this study was to test the hypothesis that employees will find technology more useful if a leader implicitly states its usefulness and benefits of using the technology. The population for the study was an oil and gas company in Malaysia. From the 5,000 employees in the company, the sample size was reduced to 250 usable employees of which only 203 responded to the survey. The researchers used a cross-sectional survey design through a web-based survey that measured employees' perceptions of ease of use, usefulness, and intention to use technology. The data shows a positive correlation between the leadership styles and perceived usefulness, ease of use, and intention to use. Employee behavior is greatly influenced by leaders. The conclusion was that leaders create positive beliefs and perceptions among their employees when there is a change, including technology application.

The research extends beyond oil and gas in Malaysia and into large global companies in Turkey (Kapucu, 2021). The purpose of this study was to examine the global perception of technology by leaders. The population for the study included small and medium enterprises in Instanbul, Turkey. The sample was obtained during the Management and Leadership Summit in Turkey where 13 of the highest-ranking executives in Instanbul met. The data were collected through interviews and observations. Each executive was observed for 15 hours. The data were collected in the form of notes. The notes were then examined analyzed assigning categories to the

different texts. The data were then analyzed quantitatively by calculating the frequencies of the different categories. The researcher found that the leaders considered their role in technology to be a great one. The executives believed that they were responsible for providing the learning and development of their employees in order to prepare them for digital transformation.

Extending the research into education, Omar and Ismail (2020) conducted a study on how technology leadership plays a role in teachers' attitudes towards technology. The purpose of this study was to investigate the relationship between a principal's technology leadership and the teachers' technology self-efficacy. The population for this study were all secondary school teachers in Kedah, Malaysia. Random cluster sampling resulted in 376 teachers from 24 secondary schools participating in the study. The participants received a survey adapted from the Technology Leadership Assessment (PTLA) and the Teacher Sense of Efficacy Scale (TSES). The PTLA survey includes 32 items in five dimensions that measure the characteristics of a technology leader in school. The TSES instrument contains 24 items and measures the effectiveness of teachers on the use of instructional technology in teaching and learning. After analysis using IBM SPSS, the researchers found there is a significant positive relationship between principal technology leadership and teacher self-efficacy in technology. Teachers are more confident in integrating technology when they receive support from the administration. The researchers suggested that principals use their power to encourage teachers to use technology in student learning.

The aforementioned research implies that leaders can enhance an employee's perception of positive benefits and usefulness. Furthermore, employees' intention to use also increases as leaders' perceived usefulness and ease of use increases (Aziz et al., 2020; Kapucu, 2021; Omar & Ismail, 2020). A further review of literature concerning the

use of technology by leaders is warranted to investigate whether the intention and implication of perceived ease of use affects actual use by employees.

Acquired Expertise in Technology

Because technology is constantly changing, the usage and implementation also varies from teacher to teacher (Koral Gumusoglu & Akay, 2017). In their quantitative study, Koral Gumusoglu and Akay (2017) investigated the factors affecting technology acceptance and usage of teachers. The population for the study was language teachers at the Anadolu University School of Foreign Languages. Of those 120 teachers solicited by email, 44 submitted returned the survey. The online survey was based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model and included 24 items in seven parts: performance expectancy, effort expectancy, attitude towards using technology, social influence, facilitating conditions, self-efficacy, and anxiety. The 24 items asked the teachers to rate each statement using a Five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The researchers were able to conclude that social influence plays an important role in teachers' use of technology. The teachers are greatly influenced by administrator support based on the amount of professional development is provided by campus leaders. Most teachers felt that the support of their leadership resulted in a higher level of acceptance level and greater use of technology in their classrooms.

As mentioned, campus leaders can vary on the amount of technology they use in their classroom. The use of technology can have effects on how much emphasis campus leaders place on technology integration (Garcia, Abrego, & Jauregui, 2019; Nam, 2019). In their study, Garcia, Abrego, and Jauregui (2019) sought to discover the hardware and software used directly by elementary campus leaders and how their use of technology transmitted the importance to staff members and students. The population consisted of

elementary principals from three school districts in South Texas. Of the 56 principals contacted, 30 agreed to participate in the study. The majority of the participants, 26, were female with 4 male elementary principals and were 32 years or older. Most, 21, had 10 years of experience or more. The participants were sent a questionnaire that explored their technology use and training. The end of the questionnaire contained a link to solicit participation in an interview.

Of the 30 that completed the questionnaire, 25 agreed to be interviewed with five open ended questions. The data revealed that most principals used technology mostly for administrative purposes. All 30 participants explained that they used instructional technology to run software usage reports. All also indicated that their cellular phone was their primary technology tool. Sixty-five percent of the elementary principals shared that they felt knowledgeable on the hardware and software applications used on their campus because of training provided leaders are the technology leaders and the main motivators of faculty and students on their campuses. They recommended that campus leaders should be positive role models that promote the use of technology that promotes learning and productivity.

Nam (2019) also found that usage greatly depended on how much emphasis or attention was placed on technology by employers. The purpose of their study was to investigate different factors' influence on perceived job security, acquired expertise in technology, and the long-term projection on the transition. The data were collected by the Pew Research Center. The researcher had 700 landline respondents and 1300 mobile phone respondents to the survey. The respondents were split almost equally by gender, where male made up 50.6% of the sample. The average age of the respondents was 51 and the majority of the participants (76.0%) were White. Part of the survey focused on technology usage. Within acquired expertise in technology, the researcher included

technological readiness, preparedness, and competence for future use of technology. Nam found that overall, job characteristics and job types did not have a significant impact on job security. However, employee believed that acquiring more expertise in technology would increase job security within most fields. An implication of this research would be that employers and leadership teams that are interested in reducing job insecurity should take proactive approaches and help employees adapt to the changes by providing more professional development in the areas of acquired expertise in technology.

In the same way acquired expertise in technology is influenced by employers, technology leadership behaviors of campus leaders can affect the successful integration of technology by teachers (Gerald, 2020; Hosnan, 2019; Taylor, 2019). Taylor (2019) acknowledged that changes in education technology presented challenges for K-12 campus leaders in leading students and faculty through the use of classroom technology. The purpose of this study was to investigate the relationship between acquired expertise in technology and the learning directed by K-12 campus leaders. The researcher contacted the K-12 principals in the state of Arkansas. From the contact, 40 principals agreed to participate in the study. These principals were presented the *Unified Theory of Acceptance and Use of Technology* (UTAUT) and *Personal Responsibility Orientation Self-Directed Learning Scale* (PRO SDLS) in an online survey. The first instrument, the UTAUT was used to measure technology acceptance and the use of technology in the campuses. The second instrument, the PRO SDLS was used to find the varying degrees of significance between technology integration, attitude, experience, and computer anxiety. The study revealed that there was a positive correlation between the principals' self-directed learning and usage. The researcher makes a recommendation of increasing the amount of training leaders receive to help them become technology leaders that can engage their staff and students in technology implementation.

Hosnan (2019) also examined the role of campus leaders in teacher acquired expertise in technology and their successfully implementing technology integration plans. This mixed methods study was conducted to describe the effect of principal leader competencies on the quality of technology integration in schools. Hosnan used quantitative and qualitative data collected from principals, teachers, and state officials from the Department of Education in Indonesia. The data were collected from 88 schools and 19 state officials in Indonesia. The quantitative data were collected through a survey that measured competency indicators in six dimensions: personality/character, managerial, supervisory, entrepreneurship, and social. The qualitative data were collected through campus visit observations conducted by the researcher. The findings of the study were that principals had lower ratings than those of teachers in acquired expertise in technology and technology integration. Although the principals rated themselves lower, the higher the educational qualification of the principal, the higher self-rating of competency in technology. The teachers shared that principals needed to involve the stakeholders of the school in gaining support for the advancement in the education within the school. The recommendation was that commitment and support from state and campus leaders were required to increasing the usage and integration of technology.

Leadership qualities also play a great role in the level of support principals provide to their teachers in integrating technology in their classrooms (Gerald, 2020). The population for the study was 39 principals from a school division in Virginia. Of those solicited, 23 principals participated in the survey. Most of the participants, 78% were female, while 22% were male. Almost the majority, 22 of the 23 participants, completed the *Educational Leaders Technology Survey* (ELTS) that consists of 45-questions that measure principal technology leadership behaviors. The survey was analyzed using the SPSS software to calculate descriptive statistics and frequencies including the median,

standard deviation, skewness and kurtosis for each question. The researcher concluded that principals reported the highest technology leadership behavior in empowering teachers and learners in teaching and learning through the use of technology. There was also a lack of consistent technology leadership could contribute to inconsistent teacher implementation of technology and result in random use of technology used in the classrooms. The researcher suggested that principal preparation programs should provide training for principals in how to support developing a school culture of technology integration.

In 2019, the North Carolina (NC) state board of education approved the integration of technology competencies into their teacher and administrator appraisal system (Ellis, Lu, & Fine-Cole, 2021). This came from the belief that schools needed to develop digital age learning and identify best practices that supported teachers and students through the use of technology. A mixed-methods study by Ellis, Lu, and Fine-Cole (2021) explored the digital leadership of administrators and the influence administrators have on digital teaching. The population for this study were 52 current and former educational leadership program students in the doctoral program in a NC university. These students were emailed requested their participation. Of those 52 contacted, 21 completed the open and closed questionnaire. The participants all held at least a bachelor's degree or greater. Most of the participants, 81.0%, were female, while 19.1% were male. Their ages ranged from 21 to 60, with the majority, 47.6%, falling in the 41-50 years category.

Twelve of the 21 administrators had less than a year's experience as a school administrator. The participants were emailed a web-based questionnaire that focused on the five areas that support the digital teaching and learning standards: vision and strategy, content and instruction, human capacity and culture, personal growth and connectedness,

and community. Those administrators were then asked to participate in a 30-45-minute semi-structured interview. Only six of the survey participants completed the interview. The researchers found that administrators greatly influence their teachers as educational leaders. While the administrators all had a general awareness of the different technology standards, most agreed that there was a need for additional training in order to meet the state and national standards for supporting their campuses and teachers in digital learning. Supporting administrators in the transition to digital age teaching and learning could lead to an increase in student learning outcomes.

As part of their professional development, campus leaders should understand the factors affecting teachers' use of technology (Sahoo & Panda, 2021). In their study, Sahoo and Panda (2021) tried to determine the various factors that affect technological usage by teachers in the teaching and learning process. The population of the study were teacher educators in teacher training institutes across the Paschim Medinipur District. The sample of the study were 60 teachers from the institutes. The study was that of a quantitative model relying on a survey method to conduct the research. A descriptive research design was used in the study. Of the 60 teacher participants, 41 teachers were secondary teachers from West Bengal, India.

The researchers created their own tool, the Technological Usage Scale, for the study. The survey used a 5-point scale (Strongly Disagree, Disagree, undecided, Agree, and Strongly Agree) and included four personal factors and eight organizational factors that might affect the acquired expertise of technology by teachers. The findings revealed a high positive correlation (+0.95) between skill and personal factors but a negative correlation (-0.07) between the support and organization related factors. This indicates that campus leaders' support and organizational support increase acquired expertise in technology in the classroom. The researchers suggested that campus leaders should place

greater emphasis and more support on providing technological resources within their schools.

Summary of the Literature

Current research indicates there are many factors that can influence technology integration within a campus. Some have found that to have more effective technology integration, teachers should feel a closer presence of school leaders in the teachers' everyday pedagogical activities (Claro, Nussbaum, Lopez, & Contardo 2017; Thompson, 2021). Research indicates principals accept technology and agree that technology is necessary and useful (Jiang, Nilsen, & Whitaker, 2017; Masibo, 2017; Sterret & Richardson, 2020; Thannimalai & Raman, 2018; Ugur & Koc, 2019). There seems to be a disconnect between principals' attitude toward technology and the amount of support and training teachers receive.

Researchers find that when teachers are provided with more professional development related to technology, more technology is integrated into their classroom lessons (Thannimalai & Raman, 2018). Furthermore, teachers feel more supported when campus leaders build teacher knowledge and exhibit the need to develop technology skills (Alward & Phelps, 2019; Christensen, Eichhorn, Prestridge, Petko, Sligte, Baker, Alayyar, & Knezek, 2018; Edwards, 2020; Sterret & Richardson, 2020). Successful virtual leaders believe that greater training and development helped those that they manage because they felt that they are better able to assist others, students, and staff, during virtual learning. These researchers concluded that the role of campus leaders is to collaborate with staff and support the growth of their teachers as technology leaders. Vyas (2020) extended the research into district leadership when he found that although principals are the most influential in integrating technology within their campuses, district leaders also play a role in improving technology integration into the curriculum.

Campus leaders' attitude towards technology also greatly influences their ability to provide effective leadership in technology acceptance and integration (Beytekin & Arslan, 2018; Claro et al., 2017; Perkins-Jacobs, 2015). Research suggests that campus leaders need to get more involved in planning and demonstrate their support for the use of technology on their campuses. Beytekin and Arslan (2018) recommend prioritizing teacher development and support in technology integration for those campuses that want to increase technology in the classrooms. Although most campus leaders agree that they need to stay up to date in technology, many admit that they only use technology for managerial tasks (Aziz, Rami, Razali, & Mahadi, 2020). Research shows that leaders who create positive beliefs and attitudes towards technology among their employees or teachers see more acquired expertise in technology in the workplace or classrooms (Aziz et al., 2020; Kapucu, 2021; Omar & Ismail, 2020).

Recent studies have depicted that campus leaders who use and receive training are more effective in motivating teachers in integrating technology in the classroom and in lessons (Garcia et al., 2019; Gumusoglu & Akay, 2017; Nam, 2019;). Campus leaders and teacher participants agreed that a training program improves a participant's competence and proficiency in technology. Tied to training is technology self-efficacy. This theory of technology self-efficacy is not limited to teachers. Campus leaders who are capable and confident in handling technology and seem to positively affect the school, teachers, and students regarding success (Gerald, 2020; Hosnan, 2019; Taylor, 2019; Yost, Conrad, Watkins, Parr, & Gordon, 2019). Research shows a positive correlation between campus leaders' usage and the use of technology within the campus (Aziz et al., 2020). A lack of consistent technology leadership could potentially contribute to inconsistent technology implementation within the campus (Ellis et al., 2021; Gerald, 2020; Sahoo & Panda, 2021). Research suggests that campus leaders'

support and acquired expertise in technology increases technology integration in their campuses. In a time, such as that of a pandemic like COVID-19, the challenges and barriers needed to address and overcome as the delivery of virtual instruction was the only option for many schools and university (Center for Disease Control and Prevention, 2020). Although virtual learning is more common, accepted, and studied in higher education, more research is needed regarding the influence campus leaders have on virtual learning in K-12. After reviewing campus leaders' attitudes towards technology, integration, and expertise in technology it is critical to explain the theoretical framework and related research of this study. The following section will elaborate in depth the specifics of these matters.

Theoretical Framework

The relationship between the generative processes of meaning and behavior in relation to a person and their environment can be defined within Bandura's social cognitive theory (Bandura, 1997). The social cognitive theory was developed was developed in 1986 by Albert Bandura. This theory establishes the belief that environmental factors impact how people view themselves, most specifically how an educator might view themselves as an engaged learner within their school. This would imply that an environmental factor, such as a pandemic affects behavior both directly and indirectly. Furthermore, campus leaders impact school staff in professional development and growth through the quality of their interaction. Campus leaders influence actions people might choose to pursue, how much effort they put forth, and the outcomes they might expect from their efforts (Claro, Nussbaum, Lopez, & Contardo, 2017). Environmental factors can also influence a person's ability to cope with difficult situations or environmental demands (Perkins-Jacobs, 2015. School staff with supportive

campus leaders are more likely to view taxing tasks, such as making the change from in-person learning to virtual learning, as something to be mastered, not things to be avoided.

The attitude towards technology and acquired expertise in technology expands this theoretical framework as research and findings assist scholars in drawing conclusions on how campus leaders can influence technology integration on their campuses (Perkins-Jacobs, 2015). The framework can be used to inform and provide guiding insights concerning the constructs of attitudes towards technology, acquired expertise in technology, and technology integration within each campus. Research can positively develop campus leaders in helping to support their teachers and enhance the expectations and opportunities provided to their staff in technology professional development. Furthermore, it reveals the need for more research in finding ways campus leaders can better support their staff as they plan and collaborate to establish routines and expectations on their campuses that increase student learning.

Conclusion

This chapter presented a review of relevant literature relating to the purpose of this study. The purpose of this study was to examine the influence of COVID-19 on campus leaders' attitudes towards acquired experience in technology. In Chapter III, methodological aspects of this dissertation are detailed to include the operationalization of theoretical constructs, research purpose and questions, research design, population and sampling selection, data collection procedures, data analysis techniques, privacy and ethical considerations, and the research design limitations for this study.

CHAPTER III:

METHODOLOGY

The purpose of this study was to examine the influence of COVID-19 on campus leaders' attitudes towards acquired experience in technology. This mixed methods study collected survey data and semi-structured interviews from a purposeful sample of K-12 public campus leaders within the State of Texas. Quantitative data were collected using the *Principal's Computer Technology Survey* (PCTS) and analyzed using frequencies, percentages, paired t-tests, and Wilcoxon signed rank tests. Qualitative data were collected from one-on-one interviews and analyzed using an inductive coding process. This chapter will present an overview of the research problem, operationalization of constructs, research purpose and questions, research design, population and sample, instrumentation, data collection procedures, data analysis, privacy and ethics considerations, and research design limitations for this study.

Overview of the Research Problem

The COVID-19 pandemic affected most of the education systems worldwide and immediately changed the way public schools conducted their daily activities (Al Darayseh, 2020). As a result, schools and teachers have had to change their approach in delivering instruction (Al Darayseh, 2020). The pandemic forced schools to deliver curriculum and assess learners with the absence of hands-on activities while fostering relationships in a virtual setting. Researchers have found that educational institutions have gone through various phases in digitizing instruction (Raza, Ahman, Ahman, & Akram, 2021). Teachers have turned to online learning platforms, educational technology, and other available resources to help support their classrooms. Inevitably, COVID-19 has caused changes to instruction and how schools function on a day-to-day basis. On a lighter side, COVID-19 has provided campus leaders the unexpected

opportunity to better support schoolteachers and staff while they to meet the needs of their students in their learning and growth (White, 2020). Campus leaders have had to change their behaviors and practices to strengthen their buildings while their teachers deliver instruction virtually.

Operationalization of Theoretical Constructs

The study consisted of three constructs: (a) curriculum integration, (b) attitude towards technology, and (c) acquired expertise. Curriculum integration is defined as the principal's role in integrating technology into the teaching and learning process (Machado & Chung, 2015). The attitude towards technology is defined as a person's formation of a judgement about seriousness, likelihood, and acceptability of instructional technology within the classroom (Renn & Benighaus, 2013). Acquired expertise is defined as a person's ability to use a wide range of instructional technology to communicate, organize information, and enhance one's ability to think and collaborate (Christensen & Knezek, 2016). The above listed constructs were measured using the *Principal's Computer Technology Survey* (PCTS).

Research Purpose, Questions, and Hypothesis

The purpose of this study was to examine the influence of COVID-19 on campus leaders' attitudes towards acquired experience in technology. The study addressed the following research questions:

R1: Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 integration of technology?

Ha: There is a statistically significant mean difference between a campus leader's pre and post COVID-19 integration of technology.

R2: Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 attitude towards technology?

Ha: There is a statistically significant mean difference between a campus leader's pre, and post COVID-19 attitude towards technology.

R3: Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 acquired expertise in technology?

Ha: There is a statistically significant mean difference between a campus leader's pre and post COVID-19 acquired expertise in technology.

R4: What are campus leaders' perception of how COVID-19 has impacted technology acceptance and usage on their campuses?

Research Design

For this study, the researcher used a sequential mixed-methods design (QUAN→qual). This design consisted of two phases: first, a quantitative phase and second, a qualitative phase. The advantage of implementing this design is that it allows for a more thorough and in-depth exploration of the quantitative results by following up with a qualitative phase. A purposeful sample of K-12 public school campus leaders within the State of Texas were solicited to complete the *Principal's Computer Technology Survey* (PCTS). Qualitative data were collected through semi-structured interviews to obtain campus leaders' perceptions of the influence COVID-19 has had on technology acceptance and usage on their campuses. Quantitative data were analyzed using frequencies, percentages, paired t-tests, and Wilcoxon signed rank tests. while qualitative data were analyzed using an inductive coding process.

Population and Sample

The population of this study consisted of K-12 public school campus leaders within the 1,029 school districts in state of Texas. Table 3.1 presents the types of campus leaders within the state of Texas for the 2019-2020 school year. There are a total of 21,664 campus principals and assistant principals in Texas. A purposeful sample of

primary and secondary (K-12th grade) campus leaders were solicited to participate in this study. Table 3.2 presents the breakdown of the demographics of the campus leaders solicited as a part of this study. Currently, campus leaders in the state of Texas are 65.5% female and 34.5% male. Over half (53.5%,) of the campus leaders are White, 27.2% are Hispanic, 16.6% are Black, and 2.9% are American Indian, Native Hawaiian/Other Pacific, or Two or more ethnicities.

Table 3.1

Campus Leaders of K-12 Schools in the State of Texas

	Frequency (n)	Percentage (%)
Assistant Principals	12,830	59.2
Principals	8,833	40.8

Table 3.2

Demographics of Campus Leaders of K-12 Public Schools in Texas

	Frequency(n)	Percentage (%)
Total Leaders	21,663	100.0
1. Gender		
Female	14,198	65.5
Male	7,465	34.5
2. Race/Ethnicity		
American Indian	78	0.4
Asian	207	1.0
Black	3,596	16.6
Hispanic	5,894	27.2
Native Hawaiian/Other Pacific	57	0.3
White	11,580	53.5
Two or more races	252	1.2
3. Age		
21 to 29	422	1.9
30 to 39	5,931	27.4
40 to 49	9,375	43.3
50 to 59	4,880	22.5
60 or 69	972	4.5
70 or older	83	0.4

Participant Selection

After survey data results were analyzed, a purposeful sample of campus leaders representing the current demographic makeup of the entire state were selected for interviews. The participants were campus leaders that were already campus administrators prior to the COVID-19 pandemic. The participants were evenly split between elementary and secondary assistant principals and principals, representing males and females evenly. Participants should have at least two years as a campus leader, as to have relevant experience both prior to and during COVID-19.

Instrumentation

The *Principal's Computer Technology Survey* (PCTS) was first created by Hope and Brockmeier in 2002. It was later modified in 2005 by Brockmeier, Sermon, and Hope to present evidence of validity. The researchers examined the purpose statement, survey directions, and item clarity. They decided to change the purpose statement to be more people-centered and rewrote four items to make the intent of the statements clearer to future respondents. The purpose of the survey is to examine a principal's: (a) role (facilitation or participation) in integrating technology into the teaching and learning process, (b) attitudes towards technology for managerial or administrative tasks and in teaching and learning, (c) acquired expertise in using computer technology, and (d) professional development needs to enhance computer technology skills. The items ask for confidence levels in five subscales; (a) curriculum integration, (b) attitudes, (c) acquired expertise, (d) needs assessment, and (e) professional development. The survey consists of 40 items. For the purposes of this study, only the first three subscales were utilized. Principals' responses to items within the subscales were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The internal consistency/reliability of the ASSP scale was measured using Cronbach's alpha ($\alpha = 0.94$). The reliability for each subscale was estimated after it was reexamined, and the instrument was validated in 2005. The range for the items was 40 to 200 and the composite was 120. High values as a result in the survey would indicate a high interest in the integration and usage in technology. The test analysis by subscales for the PCTS are listed in Table 3.3.

Table 3.3

Test Analysis by Subscales for the PCTS

Subscale	Cronbach's Alpha
1. Curriculum integration	0.82
2. Perception	0.60
3. Acquired expertise	0.75
4. Need assessment	0.86
5. Professional development	0.85

Data Collection Procedures

Quantitative

Prior to data collection, the researcher obtained approval from the University of Houston – Clear Lake's (UHCL's) Committee for Protection of Human Services (CPHS) and the school district in which the study will take place. Next, the participating campus leaders were contacted via email with information regarding the purpose of the study and the process for collecting the surveys. The researcher disseminated an email with the electronic link containing the *Principal's Computer Technology Survey* (PCTS). The survey was completed on the Qualtrics platform. The purpose of the study, voluntary participation, the timeframe for completing the survey, as well as ethical and confidentiality considerations was communicated to participants in a cover letter attached to the email. Participants were informed that consent will be assumed based on completion of the survey.

The survey responses were collected over a three-week period. The researcher notified potential participants via email at the beginning of the data collection period. The

researcher sent follow-up emails on weeks two and three of the data collection period. The results of the survey were exported into an excel file from Qualtrics and imported into the IBM Statistical Package for Social Sciences (SPSS). The data file and survey notes are be stored on the researcher's computer in a password-protected file and in the researcher's office within a locked file cabinet. The researcher will maintain the data for five years, and then destroy the data.

Qualitative

Participants were solicited to participate in a 15-minute, semi-structured interview containing 10 questions. The interviews were audio-taped and transcribed. All campus principals and assistant principals that completed the survey were invited to participate in the interviews on the last question in the survey. The interview questions were designed by the researcher and evaluated by peers and university faculty. Questions were selected and piloted in November of 2020 through recorded phone calls. The interviews were conducted with the campus leaders that agreed to be participants in the study. Participants selected the date and time of each of the interviews, based on a time that was convenient for them. The researcher reminded the participants the purpose of the study before beginning the interview. All except one of the interviews were completed between 15 and 20 minutes. One of the interviews lasted 22 minutes. Each of the interviews were digitally recorded, transcribed, and coded for themes. The participants were assigned pseudonyms to protect their identities in the study. The overarching question during interviews was, *How has COVID-19 impacted technology acceptance and usage on your campus?*

Data Analysis

Quantitative

Following the data collection, the data were downloaded from Qualtrics using Microsoft Excel into the IBM SPSS program for further analysis. To answer questions one through three, examining the mean differences of pre and post COVID-19 integration of technology, pre and post COVID-19 attitude towards technology, and pre and post COVID-19 acquired expertise in technology, data were analyzed using frequencies, percentages, paired t-tests, and Wilcoxon signed rank tests. The researcher collected, analyzed, and triangulated the data for the surveys and interviews.

Qualitative

The qualitative analysis process includes validation by using a triangulation of the responses from each of the participants. As a part of member checking, participants were provided a transcript of their interview to ensure the validity of the dialogue gathered. Following the transcription process of the recorded interviews, the qualitative data were analyzed using thematic analysis. The transcripts were coded to identify patterns and themes. The researcher looked for commonalities in all the responses, looked for commonalities in elementary campus leaders' responses, and finally looked for commonalities in secondary campus leaders' responses. Once commonalities emerged, the researcher re-coded the transcripts and reanalyzed the codes to refine the overarching themes in each of the interviews. The emergent themes were used to describe how campus leaders feel instruction has changed because of COVID-19. Once themes were established, the researcher began to collect quotes from the interviews that would support the themes.

Qualitative Validity

The qualitative data analysis included several validation methods. A content expert reviewed the pilot questionnaire to determine the validity. Following the review, the questionnaire was refined. After each interview was transcribed, the transcripts were subject to member-checking where participants were provided a transcript of their interview to ensure the validity of the dialogue gathered. The campus leaders were encouraged to review the transcripts and provide feedback and clarification when necessary. Once the researcher organized and verified interview transcripts, the interviews were validated by using a triangulation of individual campus leaders' responses in both the surveys and interviews.

Researcher bias was acknowledged and addressed. Researchers needed to be aware of how their prior experiences and beliefs may affect the ability to remain objective during the different phases of research (Creswell & Poth, 2017). Researcher bias may exist in the prior experience as a campus leader as well as a former instructional technology trainer may cause assumptions by the researcher that other leaders value and see technology as vital. Additionally, the researcher believed that technology provides a viable means to deliver instruction and build relationships with students that are unable to be on campus.

Privacy and Ethical Considerations

The researcher obtained permission from CPHS prior to data collection. Campus leader's emails were obtained through a Public Information Request through the Texas Education Agency. A survey cover letter with detailed information related to the purpose of the study and directions for completing the survey was attached to the solicitation email being sent to campus leaders' emails. The name of the school district and names of the participants were not mentioned in the study. Interview participants received an

invitation via e-mail describing the study's purpose, estimated length of each interview, disclosure that the interviews would be recorded and transcribed, assurance that participation was voluntary would remain confidential. The researcher used methods, such as assigning pseudonyms, to protect confidentiality during the qualitative component of the study. Participants were informed that their participation was completely voluntary and that identities will remain confidential during reporting. The data file and survey notes will be stored on the researcher's computer in a password-protected file and in the researcher's office within a locked file cabinet. The data will be maintained by the researcher for five years, and then destroyed.

Research Design Limitation

The research design consisted of several limitations. The first is the study's limited sample size. The sample was limited to campus leaders belonging to one state. Generalizing this research to other states with different demographic populations or geographical settings should be done with caution. Second, the implementation of instruction delivered virtually varies between those schools that are offering the option for in-person and virtual learning and those that have limited their students to only the in-person setting. Third, the attitude towards technology of the campus leaders interviewed may vary depending on their district's guidance throughout the pandemic. The influence of districts has not been studied and some campus leaders are limited in the decisions that they can make in their building. Finally, campus leaders may have delegated the responsibility to support teachers during COVID-19 to staff such as campus technology specialists. Their attitude towards technology may not be a true reflection of how instruction has changed because they had others to better support their staff.

Conclusion

The purpose of this study was to examine the influence of COVID-19 on campus leaders' attitudes towards acquired experience in technology. This chapter provided an overview of the research problem, operationalization of theoretical constructs, research purpose, questions, research design, population and sampling selection, instrumentation to be used, data collection procedures, data analysis, privacy and ethical considerations, and the research design limitations of the study. In Chapter four, survey and interview data will be analyzed and discussed in further detail

CHAPTER IV:

RESULTS

The purpose of this study was to examine the influence of COVID-19 on campus leaders' attitudes towards acquired experience in technology. This chapter presents the results of the quantitative and qualitative data analyses of this study. Campus leaders' curriculum integration, attitudes towards technology, and acquired expertise in technology were measured using the *Principal's Computer Technology Survey* (PCTS). The results were analyzed using descriptive statistics, paired t-tests, and Wilcoxon signed rank tests to compare the responses to examine the pre and post COVID-19 responses. Campus leaders' perceptions of how COVID-19 has impacted technology acceptance and usage on their campus were evaluated through interviews with voluntary participants, and the data were analyzed using an inductive and deductive coding process to find common emerging themes.

Participant Demographics

Participants for this study consisted of K-12 campus administrators working in public schools in the State of Texas. Two hundred forty-six Texas administrators completed the online survey. Of those, only 171 were completed in their entirety. The campus leaders were solicited to complete the online survey and then asked if they would be willing to participate in face-to-face interviews. Table 4.1 displays the survey participant demographics data regarding gender, race/ethnicity, age, years of teaching experience, years of administrative experience, and school level. The campus leaders participating in the quantitative portion of this study consisted of 37.8% male (n = 65), 61.1% female (n = 104), and 1.2% that preferred not to say (n = 2). The race/ethnicity majority of the campus leaders were White or Caucasian representing 55.0% (n = 94)

with Hispanic or Latino represented as the next largest race/ethnicity group at 26.3% (*n* = 45).

The participants were split between the different school levels where they served as administrators with 36.8% (*n* = 63) working at the elementary level, 26.3% (*n* = 45) working at the high school level, and 19.9% (*n* = 34) working at the middle school or intermediate level. The campus leaders were distributed between the ages of 30 and over 70 years. The majority participants, 42.7% (*n* = 73) reported their ages to be between 40 and 49 years. Teaching experience varied within the sample population according to survey responses with 36.8% (*n* = 63) reporting 6-10 years of experience, 26.9% (*n* = 46) with 11-15 years of experience, and 19.9% (*n* = 34) with 3-5 years of experience. Administrative experience also varied within the sample with 32.8% (*n* = 56) reporting 6-10 years of experience, 21.6% (*n* = 37) with 3-5 years of experience, 16.4% (*n* = 28) with 11-15 years of experience, and 13.5% (*n* = 23) with 16-20 years of experience.

Table 4.1

K-12 Campus Leaders Survey Participant Demographics

	Frequency (n)	Percentage (%)
1. Gender		
Male	65	38.0
Female	104	60.8
Prefer not to say	2	1.2
2. Race/Ethnicity		
American Indian	2	1.2
Asian	1	0.6
African American	26	15.2
Hispanic/Latino	45	26.3
White/Caucasian	94	55.0
Two or More	1	0.6
Prefer not to say	2	1.2
3. Age		
30-39 years	26	15.2
40-49 years	73	42.7
50-59 years	56	32.8
60-69 years	13	7.6
70 years or older	3	1.8
4. School Level		
Elementary	83	48.5
Intermediate	9	5.2
Middle School	36	21.1
High School	43	25.1
5. Years Teaching		
1-2 years	2	1.2
3-5 years	34	19.9
6-10 years	63	36.8
11-15 years	46	26.9
16-20 years	17	9.9
More than 20 years	9	5.3

	Frequency (n)	Percentage (%)
6. Years as Administrator		
Less than 1 year	1	0.6
1-2 years	9	5.3
3-5 years	37	21.6
6-10 years	56	32.8
11-15 years	28	16.4
16-20 years	23	13.5
More than 20 years	17	9.9

A total of 10 campus leaders were selected to be interviewed. Table 4.2 displays the interview participant demographics. Table 4.3 displays the interview participant titles and identifying designations. The campus leaders participating in the qualitative portion of the study consisted of 50.0% male (n = 5) and 50.0% female (n = 5). Their assignment levels and their campus designations were also split evenly, with 50.0% (n = 5) working at the primary or elementary level and 50.0% (n = 5) working at the secondary level and 50.0% (n = 5) working at Title 1 campuses and 50.0% (n = 5) working at non-Title 1 campuses.

Table 4.2

K-12 Campus Leaders Interview Participant Demographics

	Frequency (n)	Percentage (%)
1. Gender		
Male	5	50.0
Female	5	50.0
2. Campus Level		
Elementary	5	50.0
Secondary	5	50.0
3. Title		
Assistant Principal	7	70.0
Principal	3	30.0
4. Campus Designation		
Non-Title 1	5	50.0
Title 1	5	50.0
5. Race/Ethnicity		
White/Caucasian	5	50.00
Hispanic	3	30.00
Black/African American	1	10.00
Two or More Races	1	10.00

Table 4.3

Interviewed Campus Leaders' Titles and Identifying Campus Designations

Pseudonym	Campus Level	Title	Campus Designation
Craig	Elementary	Principal	Non-Title 1
Erica	Elementary	Assistant Principal	Non-Title 1
Roy	Elementary	Assistant Principal	Title 1
Shauna	Elementary	Assistant Principal	Title 1
Stan	Elementary	Assistant Principal	Title 1
Melissa	Secondary	Principal	Non-Title 1
Prithvi	Secondary	Principal	Non-Title 1
Briana	Secondary	Assistant Principal	Title 1
Jacob	Secondary	Assistant Principal	Non-Title 1
Theresa	Secondary	Assistant Principal	Title 1

Research Question 1

Research question one, *Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 curriculum integration?,* was answered by conducting a paired t-test and analyzing descriptive statistics to determine if there was a statistically significant mean difference in curriculum integration before and after COVID-19. Table 4.4 displays the mean difference of pre and post COVID-19 curriculum integration. Results of the paired t-test indicated there was a statistically significant mean difference between pre- and post-COVID-19 curriculum integration, $t(170) = 4.28$, $p < .001$, d = .70 (large effect size), $r^2 = .25$. The average curriculum

integration decreased from prior (M = 2.41) to post COVID-19 curriculum integration (M = 1.65), indicating that curriculum integration increased. COVID-19 had a large effect on curriculum integration and 25.0% of the variance in their curriculum integration is attributable to the pandemic. Additionally, the results of the Wilcoxon signed rank test indicated that statistically significant mean differences ($p < .001$) existed between all nine of the pre- to post-COVID-19 items.

Table 4.4

Pre and Post COVID-19 Curriculum Integration

Time	N	M	SD	t	df	p-value	d	r^2
Pre COVID-19	171	2.41	0.77	4.28	170	<.001*	.70	.25
Post COVID-19	173	1.65	0.60					

*Statistically significant ($p < .05$)

The PCTS includes a 5-point Likert scale for each of the items (1 = strongly agree, 5 = strongly disagree). This subscale was designed to identify the amount of time or technology integration that a campus leader supports within their campus. Table 4.5 illustrates the frequency/percentage of individual participant responses from campus leaders regarding curriculum integration in the pre and post PCTS survey instrument. Table 4.6 illustrates the campus leaders' collapsed responses on the 18 questions regarding curriculum integration.

The percentage of campus leaders answering *strongly agree/agree* greatly increased by 36.3% in item one and 38.0% in item two. Agreement in items one, *I allocated a significant amount of time to assist teachers in integrating computer technology into their instruction* and two, *Facilitating computer technology integration into the teaching and learning process was one of my important instructional tasks,*

suggests that campus leaders have increased the amount of time and effort that they have given to teachers in supporting and training their teachers in integrating computer technology into their instruction. The smallest increase in percentages, 8.2%, between the pre- and post- COVID-19 responses was for item eight, *I encouraged teachers' use of computer technology to meet learners' individual needs,* indicating that campus leaders were already encouraging teachers to integrate technology in their classrooms pre-COVID-19.

Table 4.5

Campus Leaders' Pre and Post COVID- 19 Curriculum Integration

Campus Leader Beliefs		Strongly Agree	Some what Agree	Neither Agree nor Disagree	Some what Disagree	Strongly Disagree
1. I allocated a significant amount of time to assist teachers in integrating computer technology into their instruction.	Pre	18.1 (n = 31)	36.3 (n = 62)	15.8 (n = 27)	24.0 (n = 41)	5.9 (n = 10)
	Post	55.6 (n = 96)	35.1 (n = 60)	4.7 (n = 8)	2.9 (n = 5)	1.8 (n = 3)
2. Facilitating computer technology integration into the teaching and learning process was one of my important instructional tasks.	Pre	13.5 (n =23)	37.4 (n = 64)	17.0 (n = 29)	26.3 (n =45)	5.9 (n = 10)
	Post	53.8 (n = 92)	35.1 (n = 60)	5.9 (n = 10)	3.5 (n = 6)	1.8 (n = 3)
3. I was familiar with many academic software programs that teachers can use to support teaching and learning.	Pre	19.3 (n = 33)	52.1 (n = 89)	12.9 (n = 22)	13.5 (n = 23)	2.3 (n = 4)
	Post	45.0 (n = 77)	45.6 (n = 78)	3.5 (n = 6)	4.7 (n = 8)	1.2 (n = 2)
4. I supported computer technology integration in teachers' instruction by providing computer technology training experiences.	Pre	22.2 (n = 38)	45.6 (n = 78)	12.9 (n = 22)	14.0 (n = 24)	5.3 (n = 9)
	Post	60.2 (n = 103)	29.2 (n = 50)	6.4 (n = 11)	2.9 (n = 5)	1.2 (n = 2)

Campus Leader Beliefs		Strongly Agree	Some what Agree
5. I encouraged teacher collaboration in using computer technology for teaching and learning.	Pre	35.1 (n = 60)	48.0 (n = 82)
	Post	70.8 (n = 121)	25.2 (n = 43)
6. I provided teachers release time to facilitate their becoming familiar with the capabilities of technology devices.	Pre	14.6 (n =25)	32.7 (n = 56)
	Post	40.9 (n = 70)	33.3 (n = 57)
7. I provided teachers release time to evaluate software to determine its appropriateness for integration into the teaching and learning process.	Pre	5.3 (n = 9)	29.2 (n = 50)
	Post	26.3 (n = 45)	35.1 (n = 60)
8. I encouraged teachers' use of computer technology to meet learners' individual needs.	Pre	38.6 (n = 66)	49.7 (n = 85)
	Post	78.4 (n = 134)	18.1 (n = 31)
9. I ensured equity of access to computer technology resources.	Pre	40.4 (n = 69)	40.4 (n = 69)
	Post	76.0 (n = 130)	19.3 (n = 33)

Table 4.6

Campus Leaders' Collapsed Pre and Post COVID- 19 Curriculum Integration

Campus Leader Beliefs		Strongly Agree/Agree	Neither Agree nor Disagree	Disagree/ Strongly Disagree
1. I allocated a significant amount of time to assist teachers in integrating computer technology into their instruction.	Pre	54.4 (n = 93)	15.8 (n = 27)	24.0 (n = 51)
	Post	90.7 (n = 156)	4.7 (n = 8)	2.9 (n = 11)
2. Facilitating computer technology integration into the teaching and learning process was one of my important instructional tasks.	Pre	50.9 (n = 87)	17.0 (n = 29)	26.3 (n = 55)
	Post	88.9 (n = 152)	5.9 (n = 10)	3.5 (n = 9)
3. I was familiar with many academic software programs that teachers can use to support teaching and learning.	Pre	71.4 (n = 122)	12.9 (n = 22)	13.5 (n = 27)
	Post	90.6 (n = 155)	3.5 (n = 6)	4.7 (n = 10)
4. I supported computer technology integration in teachers' instruction by providing computer technology training experiences.	Pre	67.8 (n = 116)	12.9 (n = 22)	14.0 (n = 33)
	Post	89.4 (n = 153)	6.4 (n = 11)	2.9 (n = 7)
5. I encouraged teacher collaboration in using computer technology for teaching and learning.	Pre	83.1 (n = 142)	6.4 (n = 11)	9.4 (n = 18)
	Post	96.0 (n = 164)	2.9 (n = 5)	0.6 (n = 2)

Campus Leader Beliefs		Strongly Agree/Agree	Neither Agree nor Disagree	Disagree/ Strongly Disagree
6. I provided teachers release time to facilitate their becoming familiar with the capabilities of technology devices.	Pre	47.3 (n = 81)	14.0 (n = 41)	17.0 (n = 49)
	Post	74.2 (n = 127)	9.4 (n = 16)	9.4 (n = 20)
7. I provided teachers release time to evaluate software to determine its appropriateness for integration into the teaching and learning process.	Pre	34.5 (n = 59)	19.3 (n = 33)	26.9 (n = 79)
	Post	61.4 (n = 105)	19.9 (n = 34)	14.6 (n = 32)
8. I encouraged teachers' use of computer technology to meet learners' individual needs.	Pre	88.3 (n = 151)	5.9 (n = 10)	5.9 (n = 10)
	Post	96.5 (n = 165)	2.3 (n = 4)	0.6 (n = 2)
9. I ensured equity of access to computer technology resources.	Pre	80.8 (n = 138)	5.3 (n = 9)	11.1 (n = 24)
	Post	95.3 (n = 163)	2.9 (n = 5)	1.2 (n = 3)

Research Question 2

Research question two, Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 attitudes towards technology?, was answered by conducting a paired t-test and analyzing descriptive statistics to determine if there was a statistically significant mean difference in curriculum integration before and after COVID-19. Table 4.7 displays the mean difference of pre and post COVID-19 attitudes towards technology. Results of the paired t-test indicated there was a statistically significant mean difference between pre- and post-COVID-19 attitudes towards technology, $t(170) = 7.26$, $p < .001$, $d = .53$ (large effect size), $r^2 = .43$. The average attitudes towards technology decreased from prior ($M = 2.52$) to post COVID-19 ($M = 1.23$), indicating that the perception of how useful technology was increased. COVID-19 had a large effect on curriculum integration and 43% of the variance in their perception of technology is attributable to the pandemic. Additionally, the results of the Wilcoxon signed rank test indicated that statistically significant mean differences ($p < .001$) existed between seven of the eight of the pre- to post-COVID-19 items and $p < .05$ for one item.

Table 4.7

Pre and Post COVID-19 Attitudes Towards Technology

Time	N	M	SD	t	df	p-value
Pre COVID-19	186	2.54	.63	7.71	185	<.001
Post COVID-19	186	2.24	.65			

*Statistically significant ($p < .05$)

The PCTS includes a 5-point Likert scale for each of the items (1 = strongly agree, 5 = strongly disagree). This subscale was designed to identify the attitude a campus leader holds regarding technology. Table 4.8 illustrates the frequency/percentage of individual participant responses from campus leaders regarding attitudes towards technology in the pre and post PCTS survey instrument. Table 4.9 illustrates the campus leaders' collapsed responses on the 16 questions regarding attitudes towards technology.

Although the percentage increases were not as great in this subscale, the greatest increases in agreement were in items three and five. Agreement in item three, *Principals' professional development to use computer technology was a focus of the district's efforts to infuse computer technology into schools,* increased 24.6% and item five, *My computer technology expertise contributed to me being viewed as a technology leader in the school,* increased 21.7%, indicating that campus leaders viewed districts' efforts as more focused on integrating technology within curriculum and more awareness and emphasis for campus leaders to assume the role as technology leaders on their campus. Item eight, *My ability to use computer technology improved my managerial or administrative performance*, increased by 4.7%, indicating that although campus leaders' ability to use computer technology increased, the product of that increased use minimally impacted their performance.

Table 4.8

Campus Leaders' Pre and Post COVID- 19 Attitudes Towards Technology

Campus Leader Beliefs		Strongly Agree	Some what Agree	Neither Agree nor Disagree	Some what Disagree	Strongly Disagree
1. The integration of computer technology into the teaching and learning process was a decision best made by the teacher.	Pre	16.4 (n = 28)	56.1 (n = 96)	15.2 (n = 26)	9.9 (n = 17)	2.3 (n = 4)
	Post	20.5 (n = 35)	37.4 (n = 64)	8.2 (n = 14)	26.3 (n = 45)	7.6 (n = 13)
2. Computer technology generally provided a more efficient way to complete tasks than using paper and pencil	Pre	18.1 (n =31)	46.8 (n = 80)	19.9 (n = 34)	12.9 (n =22)	2.3 (n = 4)
	Post	32.2 (n = 55)	44.4 (n = 76)	12.3 (n = 21)	9.9 (n = 17)	1.2 (n = 2)
3. Principals' professional development to use computer technology was a focus of the district's efforts to infuse computer technology into schools.	Pre	12.3 (n = 21)	38.0 (n = 65)	14.6 (n = 25)	25.7 (n = 44)	9.4 (n = 16)
	Post	31.0 (n = 53)	43.9 (n = 75)	13.5 (n = 23)	7.0 (n = 12)	4.7 (n = 8)
4. Computer technology was used to improve student academic achievement.	Pre	19.3 (n = 33)	56.1 (n = 96)	15.2 (n = 26)	8.2 (n = 14)	1.2 (n = 2)
	Post	43.9 (n = 75)	42.7 (n = 73)	8.8 (n = 15)	3.5 (n = 6)	1.2 (n = 2)

Campus Leader Beliefs		Strongly Agree	Some what Agree	Neither Agree nor Disagree	Some what Disagree	Strongly Disagree
5. My computer technology expertise contributed to me being viewed as a technology leader in the school.	Pre	14.6 (n = 25)	27.5 (n = 47)	24.0 (n = 41)	22.8 (n = 39)	11.1 (n = 19)
	Post	25.7 (n = 44)	38.1 (n = 65)	22.2 (n = 38)	7.6 (n = 13)	6.4 (n = 11)
6. I was capable of evaluating computer technology that can be used to support instruction.	Pre	17.5 (n = 30)	48.5 (n = 83)	12.9 (n = 22)	17.5 (n =30)	3.5 (n = 6)
	Post	31.0 (n = 53)	42.7 (n = 73)	14.0 (n = 24)	10.5 (n = 18)	1.8 (n = 3)
7. The Technology Standards for School Administrators (TSSA) assisted me to facilitate computer technology integration into instruction.	Pre	5.9 (n = 10)	16.4 (n = 28)	32.8 (n = 56)	22.2 (n = 38)	22.8 (n = 39)
	Post	9.9 (n = 17)	19.3 (n = 33)	33.3 (n = 57)	22.2 (n = 38)	15.2 (n = 26)
8. My ability to use computer technology improved my managerial or administrative performance.	Pre	35.7 (n = 61)	45.6 (n = 78)	10.5 (n = 18)	6.4 (n = 11)	1.8 (n = 3)
	Post	42.7 (n = 73)	43.3 (n = 74)	8.8 (n = 15)	4.1 (n = 7)	1.2 (n = 2)

Table 4.9

Campus Leaders' Collapsed Pre and Post COVID- 19 Attitudes Towards Technology

Campus Leader Beliefs		Strongly Agree/Agree	Neither Agree nor Disagree	Disagree/ Strongly Disagree
1. The integration of computer technology into the teaching and learning process was a decision best made by the teacher.	Pre	72.5 (n = 124)	15.2 (n = 26)	12.2 (n = 21)
	Post	57.9 (n = 99)	8.2 (n = 14)	33.9 (n = 58)
2. Computer technology generally provided a more efficient way to complete tasks than using paper and pencil	Pre	64.9 (n = 111)	19.9 (n = 34)	15.2 (n = 26)
	Post	76.6 (n = 131)	12.3 (n = 21)	11.1 (n = 19)
3. Principals' professional development to use computer technology was a focus of the district's efforts to infuse computer technology into schools.	Pre	50.3 (n = 86)	14.6 (n = 25)	35.1 (n = 60)
	Post	74.9 (n = 128)	13.5 (n = 23)	11.7 (n = 20)
4. Computer technology was used to improve student academic achievement.	Pre	75.4 (n = 129)	15.2 (n = 26)	9.4 (n = 16)
	Post	86.6 (n = 148)	8.8 (n = 15)	4.7 (n = 8)
5. My computer technology expertise contributed to me being viewed as a technology leader in the school.	Pre	42.1 (n = 72)	24.0 (n = 41)	33.9 (n = 58)
	Post	63.8 (n = 109)	22.2 (n = 38)	14.0 (n = 24)

Campus Leader Beliefs		Strongly Agree/Agree	Neither Agree nor Disagree	Disagree/ Strongly Disagree
6. I was capable of evaluating computer technology that can be used to support instruction.	Pre	66.0 (n = 113)	12.9 (n = 22)	21.0 (n = 36)
	Post	73.7 (n = 126)	14.0 (n = 24)	12.3 (n = 21)
7. The Technology Standards for School Administrators (TSSA) assisted me to facilitate computer technology integration into instruction.	Pre	22.3 (n = 38)	32.8 (n = 56)	45.0 (n = 77)
	Post	29.2 (n = 50)	33.3 (n = 57)	37.4 (n = 64)
8. My ability to use computer technology improved my managerial or administrative performance.	Pre	81.3 (n = 139)	10.5 (n = 18)	8.2 (n = 14)
	Post	86.0 (n = 147)	8.8 (n = 15)	5.3 (n = 9)

Research Question 3

Research question three, *Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 acquired expertise?,* was answered by conducting a paired t-test to determine if there was a statistically significant mean difference in curriculum integration before and after COVID-19. Table 4.10 displays the mean difference of pre and post COVID-19 acquired expertise. Results of the paired t-test indicated there was no statistically significant mean difference between pre- and post-COVID-19 acquired expertise, $t(170) = 0.63$, $p = .528$. As a lower mean would indicate, the average acquired expertise increased very little from prior (M = 1.72) to post COVID-19 acquired expertise (M = 1.71). COVID-19 had no effect on acquired expertise in campus leaders as $p>0.005$.

Table 4.10

Pre and Post COVID-19 Acquired Expertise

Time	N	M	SD	t	df	p-value
Pre COVID-19	171	1.72	0.39	.63	170	.528
Post COVID-19	173	1.71	0.43			

*Statistically significant ($p < .05$)

The PCTS includes a 5-point Likert scale for each of the items (1 = strongly agree, 5 = strongly disagree). This subscale was designed to identify the acquired expertise campus leaders hold regarding technology. Table 4.11 illustrates the frequency/percentage of individual participant responses from campus leaders regarding their acquired expertise in the pre and post PCTS survey instrument. Table 4.12 illustrates the campus leaders' collapsed responses on the 16 questions regarding acquired expertise. The acquired expertise, or use of technology, by campus leaders was not significantly different when compared pre- and post-COVID-19 with the mean for the pre-COVID responses at 92.1 percent in agreement and 92.4 percent in agreement for the post-COVID responses. As noted in the table, campus leaders were in agreement with most of the acquired expertise in technology statements, indicating that their acceptance and usage was already in place pre-COVID-19.

Table 4.11

Campus Leaders' Pre and Post COVID- 19 Acquired Expertise

Campus Leader Beliefs		Strongly Agree	Some what Agree	Neither Agree nor Disagree	Some what Disagree	Strongly Disagree
1. I routinely used a word-processing program to compose correspondence (memos and letters).	Pre	86.6 (n = 148)	8.8 (n = 15)	0.6 (n = 1)	2.3 (n = 4)	1.8 (n = 3)
	Post	87.7 (n = 150)	7.0 (n = 12)	1.8 (n = 3)	2.0 (n = 4)	1.2 (n = 2)
2. I routinely used electronic mail (e-mail) to communicate with faculty, staff, and colleagues.	Pre	95.3 (n =163)	4.1 (n = 7)	0.0 (n = 0)	0.6 (n =1)	0.0 (n = 0)
	Post	93.0 (n = 159)	5.9 (n = 01)	0.6 (n = 1)	0.0 (n = 0)	0.6 (n = 1)
3. I used computer technology on a regular basis to develop schedules.	Pre	82.5 (n = 141)	12.9 (n = 22)	2.9 (n = 5)	0.0 (n = 0)	1.8 (n = 3)
	Post	84.2 (n = 144)	11.1 (n = 19)	2.3 (n = 4)	1.2 (n = 2)	1.2 (n = 2)
4. I used computer technology on a regular basis to create databases.	Pre	60.8 (n = 104)	23.4 (n = 40)	9.9 (n = 17)	3.5 (n = 6)	2.3 (n = 4)
	Post	67.3 (n = 115)	18.7 (n = 32)	7.6 (n = 13)	3.5 (n = 6)	2.9 (n = 5)
5. I used computer technology on a regular basis to construct budgets.	Pre	52.6 (n = 90)	22.8 (n = 39)	17.5 (n = 30)	2.9 (n = 5)	4.1 (n = 7)
	Post	55.0 (n = 94)	21.0 (n = 36)	15.2 (n = 26)	2.3 (n = 4)	6.4 (n = 11)

Campus Leader Beliefs		Strongly Agree	Some what Agree	Neither Agree nor Disagree	Some what Disagree	Strongly Disagree
6. I used computer technology on a regular basis to make presentations.	Pre	83.0 (n = 142)	14.6 (n = 25)	1.8 (n = 3)	0.6 (n = 1)	0.0 (n = 0)
	Post	87.1 (n= 151)	11.7 (n = 20)	0.6 (n = 1)	0.6 (n = 1)	0.0 (n = 0)
7. I accessed and navigated within the district's information management system to retrieve information.	Pre	81.9 (n =140)	15.2 (n = 26)	1.2 (n = 2)	1.8 (n =3)	0.0 (n = 0)
	Post	87.7 (n = 150)	9.4 (n = 16)	1.8 (n = 3)	1.2 (n = 2)	0.0 (n = 0)
8. I accessed the Florida Information Resource Network (FIRN) for information.	Pre	4.7 (n = 8)	1.2 (n = 2)	21.6 (n = 37)	4.7 (n = 8)	67.8 (n = 116)
	Post	5.3 (n = 9)	0.6 (n = 1)	17.5 (n = 30)	4.1 (n = 7)	72.5 (n = 124)

Table 4.12

Campus Leaders' Collapsed Pre and Post COVID- 19 Acquired Expertise

Campus Leader Beliefs		Strongly Agree/Agree	Neither Agree nor Disagree	Disagree/ Strongly Disagree
1. I routinely used a word-processing program to compose correspondence (memos and letters).	Pre	95.4 (n = 163)	0.6 (n = 1)	4.1 (n = 7)
	Post	94.7 (n = 162)	1.8 (n = 3)	3.2 (n = 6)
2. I routinely used electronic mail (e-mail) to communicate with faculty, staff, and colleagues.	Pre	99.4 (n = 170)	0.0 (n = 0)	0.6 (n = 1)
	Post	98.9 (n = 160)	0.6 (n = 1)	0.6 (n = 1)
3. I used computer technology on a regular basis to develop schedules.	Pre	95.4 (n = 163)	2.9 (n = 5)	1.8 (n = 3)
	Post	95.3 (n = 163)	2.3 (n = 4)	2.3 (n = 4)
4. I used computer technology on a regular basis to create databases.	Pre	84.2 (n = 144)	9.9 (n = 17)	5.8 (n = 10)
	Post	86.0 (n = 147)	7.6 (n = 13)	6.3 (n = 11)
5. I used computer technology on a regular basis to construct budgets.	Pre	75.4 (n = 129)	17.5 (n = 30)	7.0 (n = 12)
	Post	76.0 (n = 130)	15.2 (n = 26)	8.7 (n = 15)

Campus Leader Beliefs		Strongly Agree/Agree	Neither Agree nor Disagree	Disagree/ Strongly Disagree
6. I routinely used a word-processing program to compose correspondence (memos and letters).	Pre	95.4 (n = 163)	0.6 (n = 1)	4.1 (n = 7)
	Post	94.7 (n = 162)	1.8 (n = 3)	3.2 (n = 6)
7. I routinely used electronic mail (e-mail) to communicate with faculty, staff, and colleagues.	Pre	99.4 (n = 170)	0.0 (n = 0)	0.6 (n = 1)
	Post	98.9 (n = 160)	0.6 (n = 1)	0.6 (n = 1)
8. I used computer technology on a regular basis to develop schedules.	Pre	95.4 (n = 163)	2.9 (n = 5)	1.8 (n = 3)
	Post	95.3 (n = 163)	2.3 (n = 4)	2.3 (n = 4)
9. I used computer technology on a regular basis to create databases.	Pre	84.2 (n = 144)	9.9 (n = 17)	5.8 (n = 10)
	Post	86.0 (n = 147)	7.6 (n = 13)	6.3 (n = 11)
10. I used computer technology on a regular basis to construct budgets.	Pre	75.4 (n = 129)	17.5 (n = 30)	7.0 (n = 12)
	Post	76.0 (n = 130)	15.2 (n = 26)	8.7 (n = 15)

Campus Leader Beliefs		Strongly Agree/Agree	Neither Agree nor Disagree	Disagree/ Strongly Disagree
6. I used computer technology on a regular basis to make presentations.	Pre	97.6 (n = 167)	1.8 (n = 3)	0.6 (n = 1)
	Post	98.8 (n = 171)	0.6 (n = 1)	0.6 (n = 1)
7. I accessed and navigated within the district's information management system to retrieve information.	Pre	97.1 (n = 166)	1.2 (n = 2)	1.8 (n = 3)
	Post	97.1 (n = 166)	1.8 (n = 3)	1.2 (n = 2)
8. I accessed the Florida Information Resource Network (FIRN) for information.	Pre	5.9 (n = 10)	21.6 (n = 37)	72.5 (n = 124)
	Post	5.9 (n = 10)	17.5 (n = 30)	76.6 (n = 131)

Research Question 4

Research question four, *What are campus leaders' perception of how COVID-19 has impacted technology acceptance and usage on their campuses?* was answered using comparison coding of 10 semi-structured interviews with K-12 campus principals and assistant principals of public schools in the state of Texas. After coding, four themes emerged: *Communication, Emotional/Behavioral Support, Technology Support,* and *Replacement vs. Creation.* The frequency of coded responses is presented in Table 4.13

Table 4.13

Frequency of Coded Interview Responses (%)

Theme	Frequency (n)	Percentage (%)
Total	124	100.0
Communication	67	54.0
Emotional/Behavioral Support	28	22.6
Technology Support	15	12.1
Replacement vs. Creation	14	11.3

These major themes were broken apart and explained in detail below.

Communication

All administrators, regardless of whether they were non-Title 1 or Title- 1 leaders, elementary or secondary school leaders, felt that technology should be used for communication. All talked about how they were already using technology for things like weekly newsletters and building connections through social media. Just as in a study by Akbaba-Altun in 2001, these campus administrators accept technology and agree that technology is necessary and useful, but then hesitate to use it. There were some differences between the different ways technology was being used at each of the different school levels. While administrators at the junior high and high school were already using some sort of learning platform or school messenger to communicate with parents school-wide, during the pandemic, the teachers began to rely heavily on technology to communicate classroom needs and information. Jacob, a junior high assistant principal explained, "Teachers are seeing the benefits of using [Learning Platform] to effectively communicate with parents. They are able to build rapport virtually."

Administrators at the elementary level felt like the pandemic brought more of a focus on using technology to communicate school and district information to the parents. communicating from district to staff to parents. Stan, an assistant principal of a K-5 school explained, "I have become primarily the means of communication. Communicating from the district to the staff to the parents." Different from the secondary level, administrators at an elementary campus also felt like technology helped but came second to phone calls and paper mailings. This was especially true in those that work at a Title-1 campus. Shauna said the following:

> I think that [Learning Platform] is great for certain populations, but it's not the best option for us in communicating to our parents. We try to be diligent and send them information electronically. Some of our parents check their email, some of them don't. Nothing beats calling a parent.

Roy agreed:

> My campus sends out everything through [school messenger], but when we need something completed or communicated, I have the teachers send home fliers and then follow up with parents that have not responded. Most of the time they tell us that they didn't see the email or didn't have time to respond when they read it.

These statements would imply that although administrators agree that technology helps with communication, those in elementary feel that more effort is needed to reach parents.

Psychological Support

Across the interview participants, administrators concurred that that they were providing psychological support due to COVID-19. The support provided can be split into two different categories: *emotional support* and *behavioral support.*

Emotional Support. Teachers were having to work harder and come up with ways to engage students virtually. Sometimes their efforts were met with failure. Once students

were allowed on campuses, teachers seemed to struggle with being able to balance their workload with in-person and virtual students and everything that comes from having blended classrooms. Melissa, a junior high principal, explained:

> I support my teachers a lot. Sometimes I have to remind them that they need to find balance in their lives. I value them being at their doors, greeting their students more than having them stress over how great their course page looks. Does it have everything the students need to learn and be successful, then who cares if it's cute?

Craig, the elementary principal, also shared, "I feel like a counselor. I have teachers crying in my office worried that they are doing what's best for kids." The role of this principal seems to have shifted towards a supportive role implying teachers need more support during challenging times, such as during the pandemic. This supportive role goes beyond providing teachers with instructional guidance.

Behavioral Support. The campus administrators stated that both teacher and students were overwhelmed with the changes. Stan, an elementary assistant principal at a Title 1 campus, spoke of becoming a support for his teachers, but in a different way. He said, "I spend my time helping teachers find resources because they seem stressed about tools. I make sure they are clear with our virtual look-fors, so that we can take that stress off of them." Another Title 1 elementary principal, Shauna, described how she was helping students behaviorally below:

> Attendance and engagement [are] where I spend most of my time. Lack of engagement when they are on camera or not showing up for virtual class is a really big issue. I spend a lot of time calling and checking on students. I am constantly emailing parents letting them know how their students are doing virtually- many of them seem surprised to hear that their student is struggling.

While teachers provided students and parents guidance with the curriculum and content required, the elementary administrators felt that they were also worried about making sure students were provided with behavior support such as routines and structures while they were at home. Stan and Shauna both spoke of example schedules that they provided to teachers and to parents to follow during virtual learning.

Technology Support

Administrators were split in terms of supporting their teachers with technology. Elementary administrators focused more on implementation of strategies and delivery of curriculum, while secondary administrators were providing more technology support around a learning platform, more to parents and less to teachers. There was no major difference between the school administrators based on campus economic designation. Craig explained, "Delivery of curriculum. "While we were off campus, helping teachers with how to instruct online was my sole role. I was helping them with that learning curve." Elementary teachers seemed to struggle with trying to recreate their classrooms while online learning was required. Many of their teaching techniques were no longer safe or possible, so they needed help with finding new tools or ways to engage with their students to teach them foundational skills.

On the other hand, in secondary schools, teachers were most used to and able to transition into online learning. Students and parents were struggling to keep up and learn the different platforms. Prithvi described his experience as a junior high school principal during school shutdowns below:

> I tasked my admin team in trying to take student technology problems or issues off of the teachers' plates. [The assistant principals] were in charge of calling students and zooming with them and making sure they were familiar or able to access [Learning

Platform]. They were responsible for showing students how to submit work, how to log into meetings, and how to communicate with their teachers if they had questions.

Although schools were expected to provide students with their technology devices for virtual learning, the administrators interviewed also spoke of providing families technology support. The administrators explained that although teachers provided their students with basics like passwords and communication, they also felt that families needed more than what the teachers had time to do for each student. As stated in the quote above, campus administrators took on this task to help alleviate some of the stress from teachers.

Replacement vs. Creation

Very much like in terms of technology support, administrators were split in how to use technology during online learning. In elementary schools, administrators felt that their teachers were using technology more for replacement, since in person was not available. Erica, an elementary assistant principal, explained, "Technology used to be more for reinforcement. Now, it is more for trying to do what we used to do in the classroom, virtually." Another elementary assistant principal, Roy, expanded on what it looked like in his school:

> My teachers were more concerned with finding tools, like a sketchpad that they could use like a chalkboard. [Technology] was not about creating or doing new things, just for substituting what they could not do in person. They seemed to be grasping for straws in finding ways to mimic what they did during in-person learning.

Campus administrators at the secondary level felt that teachers were using technology for creation and more project-based learning. Both assistant principals from Title 1 campuses and non-Title 1 campuses seemed to agree that technology was getting more students

involved in their learning. Theresa, a junior high assistant principal at a Title 1 campus described what technology looked like in a social studies classroom:

> Students are able to cater their experience to their own interests. If they are working with non-fiction or historical fiction, they can do research on their projects. They have more options of things to choose from: their own articles, authors…They take more ownership of their learning and create products.

Elementary and secondary administrators felt there was a big difference in the ways technology was being used. One could venture out and say it is because those at the secondary level, grades 6-12, could work more independently using their devices. In elementary, the teachers were simply trying to recreate the experiences from their classroom in a virtual setting, while the secondary teachers were trying to extend students' experiences while at home.

Summary of Findings

Over 30,000 surveys were emailed to campus principals and assistant principals in K-12 public schools throughout Texas. Of those, 171 administrators completed the survey in its entirety. Results of the data analysis found that there was a significant mean difference between curriculum integration and attitudes towards technology by campus leaders when comparing pre and post COVID-19 responses. There was no significant mean difference between campus leaders' acquired expertise after COVID-19. The findings suggest that COVID-19 did influence curriculum integration and the attitudes towards technology, but not the acquired expertise from campus leaders. This is supported in reflection of the qualitative research question when participants described how much support and how their roles changed during the pandemic, when virtual was required of all schools. One interesting theme that surfaced in the interviews supported

previous research that explains campus administrators support technology integration but limit their personal use of technology to managerial tasks (Akbaba-Altun, 2001).

Conclusion

This chapter presented the results of the quantitative and qualitative data analysis of this study. Overall, technology is accepted by administrators and is acknowledged as a necessary piece of education, especially when delivering instruction virtually. There were several differences in the roles and how technology was perceived by campus administrators, based on the school level they were employed at. There were very few noted differences between administrators in Title 1 campuses compared to those in non-Title 1 campuses. All believed that technology is a great tool for communication and that their roles changed because of COVID-19 but differed in the ways they supported their teachers during online learning. Chapter V will include a comparison of this study's findings and discuss any contrast with prior studies documented in the research literature. Additionally, the implications of this study's results will be discussed with considerations toward improving staff development and resources to better prepare campus administrators in the event of required online learning of all students. Further avenues for research will also be identified.

CHAPTER V:

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

Campus leaders have the opportunity to impact student learning through their influence on teachers and staff (Bush, 2018). Principals and assistant principals are trained in educational strategies and best practices that can maximize this student learning through effective teaching (Meyer & Rowan, 2006). Campus leaders must be better prepared to be efficient in supporting teachers in their classrooms, both in-person and virtually (Gigliotti, 2020). To provide staff with the support needed to deliver instruction virtually, there is a need for this study to examine effects of COVID-19 and the impact it has had on how campus leaders have changed in their integration, perception, and expertise in technology.

The study was completed during the COVID-19 pandemic in the fall semester of 2020 and spring semester of 2021. Data were collected for the quantitative portion of the study from a matched sample of pre-and post- COVID-19 survey items collected from 171 K-12 campus principals and assistant principals. Additionally, during the spring of 2021, semi-structured interviews were conducted with 10 campus leaders. Each of the interviews lasted approximately 15 minutes. The campus administrators participating in the interviews consisted of 50.0% female (n = 5) and 50.0% male (n = 5) leaders. The racial/ethnicity majority of the campus leaders were White/Caucasian representing 60.0% (n = 6) of the sample with Hispanic represented as the next largest racial/ethnic group at 30.0% (n = 3). Paired sample t-test, frequencies, percentages, and the Wilcoxon signed rank test were used to analyze the survey data collected. This chapter presents the summary, implications, and recommendations for future research of this topic.

Summary

The first three questions addressed campus leaders' curriculum integration, attitudes towards technology, and their acquired expertise in technology. The results of the quantitative data analysis found that there was a statistically significant mean difference in curriculum integration and attitudes towards technology between the pre and post COVID-19 responses in the first two research questions. Findings for research question number three indicated that there was not a statistically significant mean difference in campus leaders' acquired expertise technology pre and post COVID-19.

Research question one, *Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 curriculum integration?*, was answered by conducting a paired t-test to determine if there was a statistically significant mean difference in curriculum integration among the campus leaders between pre and post COVID-19. Quantitative analysis demonstrated a decrease in the means, indicating that integration of technology had increased post COVID-19. These results are consistent with research that principals have a direct effect on how much technology teachers use within their campuses (Jiang, Nilsen, & Whitaker, 2017; Masibo, 2017; Thannimalai & Raman, 2018; Sterret & Richardson, 2020). Both the current study and previous research indicate that campus leadership affect how much time and training teachers are provided to meet the individualized technology integration needs of their students (Jiang et. al., 2017). This study also supports research by Masibo (2017) that concluded campus leaders best supported the integration of technology by providing the resources and quality education and training in their schools.

In 2018, Thannimalai and Raman found that a principal's technology leadership was positively related to teachers' technology integration. The current study supports that research as the post COVID-19 responses indicated more technology integration related

to an increase in the amount of attention and effort campus leaders placed on integrating technology on their campuses. The study also reinforces previous research that campus leaders needed to encourage their staff to be more collaborative and develop their skills as digital leaders within their classrooms (Sterret & Richardson, 2020). Research and the current study are consistent in indicating a positive relationship between supporting campus technology integration and the amount of curriculum integration is witnessed by campus leaders (Cilsalar Sagnak & Baran, 2021).

Research question two, Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 attitude towards technology? was answered by conducting a paired t-test to determine if there was a statistically significant mean difference in attitude towards technology among the campus leaders between pre and post COVID-19. Quantitative analysis demonstrated a decrease in the means, indicating that the perception of technology in campus leaders had increased post COVID-19. These results align with the research that supports the notion that a campus leader's attitude towards technology influences their ability to provide effective leadership in effectively organizing, utilizing, and implementing technology in schools (Beytekin & Arslan, 2018; Claro, Nussbaum, Lopez, & Contardo 2017; Perkins-Jacobs, 2015). Similar to the first research question, interview responses provide evidence that explain campus leaders' positive increase in their attitudes towards technology. There is a significant positive correlation between the attitudes towards technology from campus leaders and teachers' effective use of technology in this study and previous research (Dogan, 2018).

As captured in a study by Beytekin and Arslan (2018), this study indicates that campus leaders should provide teacher development and support when they want to increase the amount of technology in the classrooms. Similar to previous research, the current study also found that campus leaders should create positive beliefs and attitudes

towards technology among their staff to increase employees' perceptions of ease of use, usefulness, and intention to integrate technology (Aziz, Rami, Razali, & Mahadi, 2020). This would explain the focus and emphasis that district and campus leaders place on training and creating an awareness of technology integration and its benefits as it relates to the increase in technology integration within their classroom (Omar & Ismail, 2020).

Research question three, *Is there a statistically significant mean difference between a campus leader's pre and post COVID-19 acquired expertise in technology?* was answered by conducting a paired t-test to determine if there was a statistically significant mean difference in acquired expertise in technology among the campus leaders between pre and post COVID-19. Quantitative analysis demonstrated no significant mean difference between pre and post COVID-19. This is consistent with previous research that the usage and implementation of technology varies from user to use (Koral Gumusoglu & Akay, 2017). Although the current study indicates that COVID-19 did not influence campus leaders' usage in technology, it does indicate that acquired expertise in technology was already highly valued. Previous research concluded that campus leaders promoted the use of technology through modeling its usage in operational and managerial tasks (Garcia, Abrego, & Jauregui, 2019; am, 2019). This study also supports a study by Sahoo and Panda (2021) that found that campus leaders supported an increase in acquired expertise in technology but limited their personal use to administrative tasks.

The interview responses indicated campus leaders' find great benefit to technology in its use for communication and meeting the needs of the student son their campus. Although there were differences in the roles and how technology was perceived, campus leaders generally accepted technology and acknowledged its integration as a necessary part of education, especially when delivering instruction virtually. The study

revealed that all campus leaders believed technology to be a great tool to communicate with the parents and community but differed in their opinions as how their teachers should be using it within their classrooms to provide instruction. The campus leaders agreed that at the beginning of the COVID-19 pandemic, staff and students were overwhelmed with the change from in-person to virtual instruction. At both the elementary and secondary level, campus leaders felt their roles transformed into those of a support for their staff as they learned how to balance their workload with in-person and virtual students. The campus leaders were split in how teachers should use technology as elementary leaders felt that their teachers were using technology more for replacement. Secondary campus leaders felt their teachers should integrate more technology into curriculum as a means for creation, such as project-based projects.

Research question four, *What are campus leaders' perspectives of how COVID-19 has impacted instruction on their campuses?* was answered using inductive thematic coding of 10 semi-structured interviews with K-12 campus principals and assistant principals of public schools in the state of Texas. After coding, four themes emerged: (a) c*ommunication,* (b) *emotional/behavioral support,* (c) *technology support,* and (d) *replacement vs. creation.* The perceptions of the campus leaders presented in-depth information and a rich description of how COVID-19 impacted instruction on their campuses. This supported previous research that technology should be used for things like weekly newsletters and communicating with families (Akbaba-Altun, 2001). The current study also supported that campus leaders need to provide teachers with more support and training if they would like more technology integration within their classrooms (Sterret & Richardson, 2020). Campus leaders understand the importance of growing their teachers in terms of professional development and seemed to understand the need to empower their teachers as technology leaders in their classrooms. In the

interviews, campus leaders also stated that they felt responsible for providing the support for learning and development of their employees, just as research by Kapucu (2021) indicated.

Implications

As a result of this study's examination of the influence COVID-19 had on campus leaders and the integration, attitudes towards technology, and use of technology on their campuses, implications for all stakeholders involved with staff professional development emerged. Previous research and the findings of this study implicate that policy makers, principal preparation programs, and district administrators are charged with preparing campus leaders for their roles as instructional technology leaders because of their direct influence on the success of their staff in technology integration and usage.

Policy Makers

This study has found that campus leaders play a critical role when trying to increase technology integration and usage within a campus. Policy makers, such as the Texas Education Agency (TEA), may want to consider an in-depth analysis of the specific criteria for hiring campus assistant principals and principals and considerations for required training and coursework to provide guidance to school districts and principal preparation programs. TEA's current guidance in principal preparation programs includes several focus areas related to curriculum, behavioral, and relational skills that individuals must obtain in order to be successful as building leaders. In addition to the current coursework required, it would be in the best interest of students and staff to certify that these future leaders are skilled in ways that technology and technology integration can increase student engagement and success.

Within these recommendations, it is important to highlight the positive correlation between campus leaders' perceptions or attitudes towards technology and technology

integration within a campus (Dogan, 2018). An increase in campus leaders' acquired expertise in technology indicates a more effective use of technology within their campus (Hosnan, 2019). Making sure future campus administrators can support staff in education specific platforms or applications would seem beneficial. The key would be to make sure these leaders understand that they do not necessarily need to be experts in educational or instructional technology, but they need to provide the resources that will create an environment where staff are comfortable learning and expanding their knowledge in ways to integrate technology into their classrooms. This would help administrators be able to support their staff in new initiatives and ensure that they are feeling successful as they grow as learners and teachers. Perhaps including instructional technology as a larger piece of the principal's certification test would be a small step in the right direction.

Higher Education/Principal Preparation Programs

A significant amount of time and professional development is spent by colleges, universities, and principal preparation programs in training future campus leaders. Coursework and training required for principal certification should be evaluated to ensure campus leaders understand the benefits and importance of integrating technology within the classrooms. Campus leaders should receive professional development in supporting their staff during unforeseen changes, such as that of COVID-19, and acknowledge that the professional growth of teachers and student achievement result from their leadership. Principal certification programs should give careful consideration to training campus leaders in examining their roles as instructional and digital leaders. Aligning campus leaders with the world's prominence of using technology in the workplace could expand the possibilities of growth in acquired expertise in technology in their teachers' classrooms (Ellis, Lu, & Fine-Cole, 2021).

As mentioned under the section, *Policy Makers*, the intent is not to make all future campus leaders technology experts. Preparation programs should focus on teaching campus leaders how to support their staff as they learn and explore new initiatives and strategies. This study revealed the need for administrators to support their teachers behaviorally and emotionally. The shift in leadership skills that focus on staff morale and community building is becoming more prevalent as more and more teachers leave the profession (Ryan, Von der Embse, Pendergast, Saeki, Segool, & Schwing, 2017). In their study, which directly relates to the need for more support, teachers claimed that stress and lack of support were the main contributors in teacher attrition. Making sure future campus administrators know how to support their staff should be a priority in principal preparation programs, as maintaining teachers in classrooms continues to be a challenge.

District Administrators

District administrators need to understand their role in affecting campuses and campus leaders' influence on teachers in their buildings. A significant investment in time and training should be invested by district administrators to provide professional development on all levels regarding technology integration. Research shows that campus administrators are more likely to assist their teachers if they have a general awareness of the technology standards and how to better support their campuses and teachers in digital learning (Ellis et al., 2021). If districts are going to mandate professional development for teachers, they should also provide professional development for their campus leaders in how to support their staff. The cost to replace a teacher costs a district anywhere from $9k to $21k depending on the years of experience and training the teacher received while working for the district (Learning Policy Institute, 2021).

Especially during a time, such as the pandemic, when staff is limited and shortages are prevalent in almost all job industries, districts should invest in creating an

awareness within their campus administrators. This awareness would include the need to support their staff and improve their working conditions. District administrators should understand the need to develop their campus leaders by providing them learning opportunities that support their ability to create efficient and productive work settings that are needed to prevent teacher attrition. Many campus staff cite lack of support from the district and their principals as the top reason for leaving the profession. They also share that they feel limited in the input in decision-making and time to collaborate with colleagues. Possibly making collaboration between educators and providing paid time for staff to share and work together should be a goal for all districts. The tradeoff of having to pay staff to train and work together would be less than having to retrain campus leaders and staff.

Recommendations for Future Research

Despite the limitations of this study, the results yield insights into the effect COVID-19 has had on instruction and technology integration and usage within public school classrooms. One future research opportunity would be to consider a study in terms of student perceptions when comparing in-person and virtual learning. Replicating this study but using students in K-12 schools would provide additional data to further develop the contributions of this work and how COVID-19 impacted instruction. Although teachers were at the front line of the pandemic and its effects on their classrooms, students can also provide valuable insight as to how their learning changed when instruction was only offered virtually. Adding this component could provide some insight as to how students felt their teachers kept them engaged and learning during the pandemic. In addition, some understanding of how students felt they learned best could provide more strategies to teachers and campus leaders on how to better support students.

A second recommendation for how this study could be used in future studies would be to continue improving principal preparation programs. As programs continue to change and provide training and professional development to campus leaders, a longitudinal study would allow researchers to establish best practices and strategies on how to better support teachers through unexpected changes. The findings of this study could provide more coaching to campus leaders in behavior or mental health support that principals and assistant principals are having to provide to their teachers. Principal preparation programs need to prepare campus leaders in being more than just instructional leaders. More and more, the role of campus leaders is evolving and becoming more of a support role as teachers are becoming more efficient in engaging learners and building problem solvers, with a lesser focus on curriculum.

A final recommendation would be to explore the perceptions of businesses and community partners and the effectiveness of public schools in preparing students for jobs and careers. Research in this area could include investigating the needs of community and how schools are preparing students beyond academics. Gaining this insight into the needs of the workplace could guide instruction and curriculum in ways that teachers can prepare students with skills they can use beyond the classroom. Campus leaders would need to assess the modifications to the curriculum and prioritize the type of learning and experiences their staff are providing to their students based on how to better prepare students for their futures.

Conclusion

The education system is constantly changing to meet the needs of students as policy changes to maximize instruction and student learning (Meyer & Rowan, 2006). The ability to adapt to those changes by a teacher is dependent upon the amount of support and professional development they receive from their campus and district leaders

(Dogan, 2018). This study looked at the influence COVID-19 had on campus leaders' attitudes towards technology integration within their campus. One hundred seventy-one K-12 campus leaders from the State of Texas were assessed using the Principals' Computer Technology Survey (PCTS). In addition, 10 assistant principals and principals were interviewed regarding their perceptions of the influence COVID-19 had on technology acceptance and usage on their campuses. Results were analyzed using frequencies, percentages, paired t-tests, and Wilcoxon signed rank tests, and then interviews were analyzed for common emergent themes. Results of the surveys revealed that COVID-19 influenced the integration and attitude towards technology. Through an analysis of the interviews, results indicated that campus leaders need to support their teachers if they want to increase the use and integration of technology.

Campus leaders often begin their careers as teachers and then prepare for leadership roles through principal preparation programs. These programs need to better prepare campus leaders in their roles as instructional and digital leaders. As their roles change, campus leaders need to support their teachers through the changes of the ever-evolving educational system (Ball, 2021). As COVID-19 influenced instruction on campuses, changes are occurring each year that affect how teachers are able to engage and teach their students. To provide staff with the support needed to deliver instruction, there is a great need to provide campus leaders with strategies on how to prepare their staff and encourage them in their learning and professional development as education changes.

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APPENDIX A:

SURVEY COVER EMAIL

Dear Administrators,

Greetings! You are being solicited to complete the *Principal's Computer Technology Survey*. The purpose of this survey is to examine the principal's role in integrating technology into the teaching and learning process, perceptions of technology, and expertise in technology.

Please try to answer all the questions. Filling out survey is entirely voluntary but answering each response will make the survey most useful. This survey will take approximately 15-20 minutes to complete, and all of your responses will be kept completely confidential. No obvious undue risks will be endured, and you may stop your participation at any time. In addition, you will also not benefit directly from your participation in the study.

Your cooperation is greatly appreciated and your willingness to participate in this study is implied if you proceed with completing the survey. Your completion of the survey is not only greatly appreciated, but invaluable. If you have any further questions, please feel free to contact me anytime. Thank you!

Sincerely,
Norma Veguilla-Martinez
University of Houston-Clear Lake
Veguillamartn7344@uhcl.ed

APPENDIX B:

INFORMED CONSENT

You are being asked to participate in the research project described below. Your participation in this study is entirely voluntary and you may refuse to participate, or you may decide to stop your participation at any time. Should you refuse to participate in the study or should you withdraw your consent and stop participation in the study, your decision will involve no penalty or loss of benefits to which you may otherwise be entitled. You are being asked to read the information below carefully and ask questions about anything you don't understand before deciding whether or not to participate.

Title: Principal's Computer Technology Survey
Principal Investigator(s): Norma Veguilla-Martinez
Faculty Sponsor: Dr. Antonio Corrales
Purpose of the Study: Examine the principal's role in integrating technology
Procedures: Survey and Interviews
Expected Duration: 2 weeks
Risks of Participation: none
{Many of the studies performed by UHCL faculty or students do not involve physical risk, but rather the possibility of psychological and/or emotional risks from participation. The principles that apply to studies that involve psychological risk or mental stress are similar to those that involve physical risk. Participants should be informed of any foreseeable risks or discomforts and provided contact information of professional agencies (e.g., a crisis hot line) if any treatment is needed.}

Benefits to the Subject

There is no direct benefit received from your participation in this study, but your participation will help the investigator(s) to better understand the principal's role in integrating technology

Confidentiality of Records

Every effort will be made to maintain the confidentiality of your study records. The data collected from the study will be used for educational and publication purposes, however, you will not be identified by name. For federal audit purposes, the participant's documentation for this research project will be maintained and safeguarded by the Principal Investigator or Faculty Sponsor for a minimum of three years after completion of the study. After that time, the participant's documentation may be destroyed.

Compensation

There is no financial compensation to be offered for participation in the study. {For research involving more than minimal risk, an explanation as to whether any compensation and an explanation as to whether any medical treatments are available if injury occurs and, if so, what they consist of, or where further information may be obtained.}

Investigator's Right to Withdraw Participant

The investigator has the right to withdraw you from this study at any time.

Contact Information for Questions or Problems

The investigator has offered to answer all of your questions. If you have additional questions during the course of this study about the research or any related problem, you may contact the Principal Investigator, Norma Veguilla-Martinez by telephone at 832-301-9030 or by email at Veguillamartn7344@uhcl.edu

Identifiable Private Information *(if applicable)*

Identifiers might be removed from identifiable private information or identifiable biospecimens and that, after such removal, the information or biospecimens could be used for future research studies or distributed to another investigator for future research studies without additional informed consent from the subject or the legally authorized representative, if this might be a possibility

Signatures

Your signature below acknowledges your voluntary participation in this research project. Such participation does not release the investigator(s), institution(s), sponsor(s) or granting agency(ies) from their professional and ethical responsibility to you. By signing the form, you are not waiving any of your legal rights.

The purpose of this study, procedures to be followed, and explanation of risks or benefits have been explained to you. You have been allowed to ask questions and your questions have been answered to your satisfaction. You have been told who to contact if you have additional questions. You have read this consent form and voluntarily agree to participate as a subject in this study. You are free to withdraw your consent at any time by contacting the Principle Investigator or Student Researcher/Faculty Sponsor. You will be given a copy of the consent form you have signed.

Subject's printed name: Click or tap here to enter text.

Signature of Subject: Click or tap here to enter text.

Date: Click or tap here to enter text.

Using language that is understandable and appropriate, I have discussed this project and the items listed above with the subject.

Printed name and title: Click or tap here to enter text.

Signature of Person Obtaining Consent: Click or tap here to enter text.

Date: Click or tap here to enter text.

THE UNIVERSITY OF HOUSTON-CLEAR LAKE (UHCL) COMMITTEE FOR PROTECTION OF HUMAN SUBJECTS HAS REVIEWED AND APPROVED THIS PROJECT. ANY QUESTIONS REGARDING YOUR RIGHTS AS A RESEARCH SUBJECT MAY BE ADDRESSED TO THE UHCL COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS (281.283.3015). ALL RESEARCH PROJECTS THAT ARE CARRIED OUT BY INVESTIGATORS AT UHCL ARE GOVERNED BY REQUIREMENTS OF THE UNIVERSITY AND THE FEDERAL GOVERNMENT.

(FEDERALWIDE ASSURANCE #FWA00004068

APPENDIX C:

PRINCIPAL'S COMPUTER TECHNOLOGY SURVEY

Principal's Computer Technology Survey

Purpose: This research examines the principal's (a) role (facilitation or participation) in integrating technology into the teaching and learning process, (b) perceptions of computer technology for managerial or administrative tasks and in teaching and learning, (c) expertise in using computer technology, and (d) professional development needs to enhance computer technology skills.

Directions: Please darken the numeral in each column that best represents your degree of agreement with each statement. 5 = Strongly Agree; 4 = Agree; 3 = Neither Agree nor Disagree; 2 = Disagree; 1 = Strongly Disagree	*Strongly Agree*	*Agree*	*Neither Agree nor Disagree*	*Disagree*	*Strongly Disagree*
Curriculum Integration					
1. I allocate a significant amount of time to assist teachers in integrating computer technology into their instruction.	(5)	(4)	(3)	(2)	(1)
2. Facilitating computer technology integration into the teaching and learning process is one of my important instructional tasks.	(5)	(4)	(3)	(2)	(1)
3. I am familiar with many academic software programs that teachers can use to support teaching and learning.	(5)	(4)	(3)	(2)	(1)
4. I support computer technology integration in teachers' instruction by providing computer technology training experiences.	(5)	(4)	(3)	(2)	(1)
5. I encourage teacher collaboration in using computer technology for teaching and learning.	(5)	(4)	(3)	(2)	(1)
6. I provide teachers release time to facilitate their becoming familiar with the capabilities of technology devices.	(5)	(4)	(3)	(2)	(1)
7. I provide teachers release time to evaluate software to determine its appropriateness for integration into the teaching and learning process.	(5)	(4)	(3)	(2)	(1)
8. I encourage teachers' use of computer technology to meet learners' individual needs.	(5)	(4)	(3)	(2)	(1)
9. I ensure equity of access to computer technology resources.	(5)	(4)	(3)	(2)	(1)
Perceptions					
10. The integration of computer technology into the teaching and learning process is a decision best made by the teacher.	(5)	(4)	(3)	(2)	(1)
11. Computer technology generally provides a more efficient way to complete tasks than using paper and pencil.	(5)	(4)	(3)	(2)	(1)
12. Principals' professional development to use computer technology has been a focus of the district's efforts to infuse computer technology into schools.	(5)	(4)	(3)	(2)	(1)
13. Computer technology can be used to improve student academic achievement.	(5)	(4)	(3)	(2)	(1)
14. My computer technology expertise contributes to me being viewed as a technology leader in the school.	(5)	(4)	(3)	(2)	(1)
15. I am capable of evaluating computer technology that can be used to support instruction.	(5)	(4)	(3)	(2)	(1)
16. The Technology Standards for School Administrators (TSSA) can assist me to facilitate computer technology integration into instruction.	(5)	(4)	(3)	(2)	(1)
17. My ability to use computer technology improves my managerial or administrative performance.	(5)	(4)	(3)	(2)	(1)
Acquired Expertise					
18. I routinely use a word-processing program to compose correspondence (memos and letters).	(5)	(4)	(3)	(2)	(1)
19. I routinely use electronic mail (e-mail) to communicate with faculty, staff, and colleagues.	(5)	(4)	(3)	(2)	(1)
20. I use computer technology on a regular basis to develop schedules.	(5)	(4)	(3)	(2)	(1)
21. I use computer technology on a regular basis to create databases.	(5)	(4)	(3)	(2)	(1)
22. I use computer technology on a regular basis to construct budgets.	(5)	(4)	(3)	(2)	(1)
23. I use computer technology on a regular basis to make presentations.	(5)	(4)	(3)	(2)	(1)
24. I access and navigate within the district's information management system to retrieve information.	(5)	(4)	(3)	(2)	(1)
25. I access the Florida Information Resource Network (FIRN) for information.	(5)	(4)	(3)	(2)	(1)

Continued on next page

Principal's Computer Technology Survey (Continued)

		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
	Needs Assessment					
26.	I would benefit from experiences that assist me to assess computer technology's influence on student achievement.	(5)	(4)	(3)	(2)	(1)
27.	I would benefit from professional development experiences that inform me on how to integrate computer technology into the curriculum.	(5)	(4)	(3)	(2)	(1)
28.	I would benefit from professional development experiences that promote my understanding of legal issues related to software licensing.	(5)	(4)	(3)	(2)	(1)
29.	I would benefit from professional development experiences that promote my understanding of ethical issues related to computer technology.	(5)	(4)	(3)	(2)	(1)
30.	I would like to participate in more professional development experiences to learn how to apply computer technology to my work as a principal.	(5)	(4)	(3)	(2)	(1)
31.	I would like to participate in professional development experiences to learn about protecting students from inappropriate materials available on the Internet.	(5)	(4)	(3)	(2)	(1)
32.	I would like to participate in computer technology professional development experiences that assist me to facilitate organizational change.	(5)	(4)	(3)	(2)	(1)
33.	I would like to participate in professional development experiences that assist me to use computer technology to collect and analyze data.	(5)	(4)	(3)	(2)	(1)
	Professional Development					
34.	The school district has offered training for principals on the use of computer technology to develop budgets.	(5)	(4)	(3)	(2)	(1)
35.	The school district has offered training for principals on the use of computer technology to create databases.	(5)	(4)	(3)	(2)	(1)
36.	The school district has provided professional development experiences for principals in using the Internet for research purposes.	(5)	(4)	(3)	(2)	(1)
37.	The school district has provided professional development for principals in using applications such as spreadsheets, presentations, e-mail, and word processing.	(5)	(4)	(3)	(2)	(1)
38.	I have participated in training designed to develop skills to facilitate teachers' integration of computer technology into the curriculum.	(5)	(4)	(3)	(2)	(1)
39.	I have experienced professional development that assists me in evaluating software applications to be used in the teaching/learning process.	(5)	(4)	(3)	(2)	(1)
40.	I have experienced professional development that assists me in evaluating computer technology hardware to be used in the teaching and learning process.	(5)	(4)	(3)	(2)	(1)

APPENDIX D:

INTERVIEW PROTOCOL

Hello, my name is Norma Martinez. Thank you for agreeing to meet with me today. I really appreciate your time to provide input for this research project. Today I hope to gain a better understanding of how you use social media tools to communicate with stakeholders. In order to ease the interview process, I am using a third-party source to record and transcribe our conversation. If at any time you would like the interview to cease, please let me know.

Do I have permission to record our interview?

Will you agree to participate in the interview after reviewing the Informed Consent agreement?

Do you have any additional questions before we start?

How would you define role in the district/campus BEFORE COVID-19?
How has your role in the district/campus changed DURING COVID-19?
Related to instruction and learning, what is one positive effect of COVID-19?
what is one negative effect of COVID-19?
What kind of changes have you implemented in the district/campus because of COVID-19?
How were the changes received by your teachers?
Will you continue to implement these changes next year? (assuming the pandemic has ended)
What was your general opinion about technology in the classroom BEFORE COVID-19?
Did you personally use technology during staff development or in the classroom when you taught?
What is your general opinion about technology in the classroom DURING COVID-19?
Once the pandemic has ended, do you believe teachers should continue to use technology to the same extent?