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REMOTE LEARNING: IMPACTING THE FUTURE OF EDUCATION

by

Jessica Hollewell

A Dissertation Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Education in Ethical Leadership

Olivet Nazarene University

Bourbonnais, Illinois

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REMOTE LEARNING: IMPACTING THE FUTURE OF EDUCATION

by

Jessica Hollewell



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## DEDICATION

This study is dedicated to my parents, Bob and Barb, who have always supported my dreams, my husband, Evan, who has always believed in me, and my school family, who has been so supportive through this endeavor.

## ABSTRACT

The Coronavirus-19 pandemic impacted society as well as multiple industries, including education. This qualitative research project aims to explore the perceptions of faculty in a small, Midwestern, private K-12 Christian school during the school shutdowns and subsequent remote learning time period from March 2020 to June 2020. Additionally, this research project aims to increase the awareness of the changing needs of students, educators, and families as well as facilitating the needed adjustments to trainings, planning, and resources for future remote learning sessions. The data for this case study was collected through semi-structured interviews at one school building with six faculty participants. In order to understand the impact of school closures on the analyzing and reporting of academic achievement, skill development, and social development, the remote learning setting was examined. Barriers to each impacted area were identified to have a direct correlation to accessibility of devices, connectivity to Internet, and personal connections. Other themes include outlying factors related to specific devices or applications as well as family support. These findings support previous studies indicating the need for specific plans and trainings to be developed for schools and teachers in order to foster education to best support students regardless of the location of the class.

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## CHAPTER I: INTRODUCTION

Education is a basic necessity to personal and professional growth of people throughout the world. With the advancement of technology and new inventions, the educational setting can be enhanced, learning experiences can dive to a deeper level, and meaningful relationships can be built. The lives of students are enriched through education, and their growth can be exponential. While new technology has brought academic growth, personal growth must also be fostered. The Coronavirus-19 pandemic brought a whole new component to the utilization of educational technology for both academic and personal growth. According to the United States Census Bureau, some type of distance learning became the norm for almost 93% of school-aged children (McElrath, 2020). Through the experiences with remote learning and new technology during the Coronavirus-19 pandemic, a new question is raised. Can remote learning with educational technology serve as an alternative to the traditional classroom?

### Background

The impact the use of educational technology during remote learning had on students is a topic for not only administrators and educators but also parents and guardians (Briggs, 2020). Educational technology continues to advance for both teachers and students, and the Coronavirus-19 pandemic brought a new challenge into the realm of research. Schools were closed, forcing teachers and students to transition to remote learning, relying upon educational technology to fill the need of a classroom setting

(Exstrom, 2020). The immediate closures left schools and families unprepared to make the transition to remote learning so quickly and without warning. Families faced difficulties with access to the internet, devices, and time to support their school-aged children along with the stress quarantine brought with or without the challenges of health (Erickson, 2020; Exstrom). Previous literature has focused on multiple variables related to educational technology and the classroom setting. Many researchers have focused on the success of educational technology in the classroom with a variety of interventions with the growth of motivation, academic achievement, and skill development (Bhagat et al., 2016; Chen et al., 2019). But, with the Coronavirus-19 pandemic, another factor emerged; student-teacher relationships and social development were now also challenged and restricted (Means & Neisler, 2021).

The remote learning setting shifted the main bridge of support from the teacher to the families and parents (Balayar & Langlais, 2022). The change in school setting impacted the personal contact students had which in turn affected the relationships between students and teachers along with their academic growth and skill development (Blahušíaková et al., 2021). Even though technology enabled remote learning and only virtual connection to teachers, it did present options for the use of educational technology in the future, especially under similar circumstances. Understanding the devices, such as Chromebooks, that are available to teachers and students will help both to be more prepared to teach and learn remotely. As Kayalar (2021) studied, applications and devices are not needed as soon as they are released, especially in the K-12 setting. But, the inclusion of applications and devices in the traditional classroom is important for both teachers and students in order to be prepared for a remote learning setting. While remote

learning is a part of the past, it will likely be part of the future as well, and there are many aspects to study not only from remote learning but also the use of educational technology in both the traditional and remote classrooms (Won et al., 2020). Even with access to the needed modes, learning how to use unfamiliar devices and applications and have the appropriate support became the first challenge to address instead of teaching and learning new material (Kim et al., 2021; Shi et al., 2022). Traditional methods of instruction did not involve online learning which in turn challenges the basics of Maslow's hierarchy of needs (Bishop, 2016). Maslow attributed the environment to the success of individuals, and the virtual environment takes away a student's sense of security (Bishop). The social aspect of the environment then translates to the academic achievement and skill development either positively or negatively. The challenge of unfamiliar devices and applications coupled with the test to the basic needs of students impacted the academic growth and skill development of students, but it also brought to light the social connections that are fostered through the traditional classroom environment.

Dunn and Kennedy (2019) stated that Technology Enhanced Learning (TEL), learning which utilizes technology, has continuously expanded across multiple levels of educational settings. While the inclusion of educational technology began with higher learning institutions, the use of devices and applications has now also become prevalent in high schools, junior highs, and even elementary schools. Dunn and Kennedy also stated that "TEL can place the students themselves in charge of their learning" instead of the teacher being the one and only director (p. 104). Students can decide what they need to investigate to understand the topic better and move at their own pace. By allowing students to be in charge of their own pace, gaps in learning can be closed and allow for

students to be better prepared for their futures in a technologically advanced society (Dunn & Kennedy). The idea of TEL needs to be analyzed with specific lenses in order to ensure that students are benefiting from the inclusion of technology instead of creating new gaps or holes that will impact them later in life much like the inclusion of remote learning as a source of future educational processes.

There are many components analyzed when considering the impact of educational technology such as motivation and skill development, but a main focus looks at the effect on academic achievement. Many researchers have studied the impact the use of multiple devices and platforms have had on the academic performance of all ages of students. Kardanova et al. (2018) used interactive tools across multiple disciplines while Muis et al. (2015) studied the use of tablets with games and applications. Partovi and Razavi (2019) took it one step further and analyzed the success of game-based learning, especially the increased engagement of students. While some of the studies did not have significant findings (Kardanova et al.; Partovi & Razavi), the students were noted to be more attentive, engaged, and motivated to learn (Partovi & Razavi). As a result of the technological interventions, the students learned more and ultimately promoted their academic achievement.

Many studies related to high schoolers have discussed the use of a different learning environment used in the flipped classroom (Bhagat et al., 2016; Sookoo-Singh & Boisselle, 2018). The flipped classroom requires the students to manage their own learning utilizing educational technology, with much being completed outside of the traditional classroom, and allows the teacher to facilitate more individualized instruction (Bhagat et al.). Students are required to do more of the background work for the concept

or lesson which includes the textbook reading and comprehension questions, but it can also utilize educational technology. Students can watch lectures and work through online platforms to set the foundation for more exploration. In turn, the completion of traditional learning through books allows for the students in the classroom setting to then explore through hands-on activities and experiments where the teacher can individualize instruction and facilitate exploration. Bhagat et al. found that the students enjoyed control over their own learning along with improved academic achievement. A similar study conducted by Sookoo-Singh and Boisselle using quantitative and qualitative analysis showed a split view of the impact of the flipped classroom setting. While students were more motivated using educational technology, they also struggled to complete the tasks outside of the traditional classroom (Bhagat et al.; Sookoo-Singh & Boisselle). Even though there was some improvement in academic performance, there were the underlying basic developmental skills to be considered in order to ensure that the use of educational technology could support the learning of all students.

Along those lines, the use of educational technology in the essence of the flipped classroom was analyzed with a lens of critical thinking skill development in the high school setting (Kong, 2015). The development of academic and personal skills was noted to have a direct correlation to academic achievement as well as with engagement and long-term learning strategies (Kong). Older age groups, such as those outside of high school, have shown significant results from the use of educational technology and the impact it had on academic achievement. Kirkpatrick et al. (2018) found similar results when studying a group of junior high students who used iPads individually and showed some increase in academic achievement in both Mathematics and English.

There is more to the picture than just the implementation of educational technology. Teachers must also receive the support they need in using educational technology. Williams et al. (2018) studied teachers in a rural high school setting in order to understand the needs of teachers. Teachers must have knowledge of the technology they are using and be able to implement it in a way to enhance students' learning. The training and adaptations that must be made are critical when developing a path in which students can succeed. With the abrupt change in the learning environments caused by the Coronavirus-19 pandemic, teachers and students alike were not prepared to tackle the monumental task of teaching and learning through a different format let alone for an extended period of time (Surkhali & Garbujja, 2020). Heimlich (2015) discovered that professional development is desperately needed for teachers to not only implement educational technologies in their classrooms but also simply identify options that would be beneficial. Khan and Khan (2020) also pointed out the importance for teachers to be trained and comfortable with the technologies available to use the resources to their greatest potential. However, the training and implementation must be focused and purposeful. As Langford et al. (2016) discovered, using the technology because it is available leaves too many openings for students to become off task. Teachers must purposefully and critically implement the use of educational technology when they need it rather than using it as a time filler or attention-getter (Langford et al.).

#### Situation to Self

As a former educator and now an administrator in the field of education, my desire is to improve the educational setting of the future. With the Coronavirus-19 pandemic, a new lens to the classroom, teaching methods, and learning strategies must be

addressed in order for students to meet educational goals, develop necessary skills, and build relationships that will promote life-long learning and success. Using a qualitative case study, I will collect direct feedback from those who experienced teaching remotely during the school shutdowns of the Coronavirus-19 pandemic. Real life information, emotions, and lessons will be gathered through the interviews and will develop a robust collection of data from which to learn for future scenarios of remote learning.

### Problem Statement

The current study focused on the use of educational technology during remote learning and the impact it had on the reporting of students' academic achievement as well as the students' skill and social development. Educational technology has been included in many classrooms and has transformed many opportunities to ensure that everyone has the opportunity to learn. Students can connect with other students online across the globe, take courses at different institutions, and even take college courses while in high school. The Coronavirus-19 pandemic brought a new dynamic to the use of educational technology as it replaced the traditional classroom setting. The pandemic closed schools and forced families to stay at home, and home became the new classroom. Technology allowed for connections to still be made between teachers and students, but many families struggled to foster the virtual, personal connection because of limited resources including access to devices and internet connection (Adnan & Anwar, 2020). Instead of educational technology enhancing the traditional classroom setting and instruction, technology became the teacher and classroom without the daily personal connection. If possible, face-to-face interaction became virtual, and personal connections were lost which led to challenging behaviors while participating in remote learning (Anderson,

2022). The personal connections, or lack thereof, had a drastic impact not only on the academic growth of the students but also the personal growth related to relationships (Exstrom, 2020). The problem was that administrators and educators did not know enough about the remote learning environment and the technology used to facilitate learning to ensure academic achievement and its reporting, skill development, and social development were fostered.

Educational technology has been implemented by teachers across the world for many years, but remote learning was not part of the typical use. A variety of companies, such as McGraw-Hill and Houghton Mifflin Harcourt, have added virtual components to curriculum and learning management platforms, but again, learning outside of the traditional classroom was not part of the curriculum and technology tools designs. As technology in general is prevalent and accessible to many in schools (Scherff, 2018), previous knowledge of applications and devices plays a large role in the success of its implementation (Awuah, 2015).

With previous knowledge as the focus, Awuah studied the impact Google Apps for Education (GAFE) had on the learning of students. According to Awuah (2015), even though the GAFE helped increase students' knowledge and their academic performance, the variability that was reported in availability and prior experience could have had an impact on the students. Some students were able to immediately focus on the learning tasks rather than learning the device if they were not familiar with it previously (Awuah). Success based solely on the use of educational technology, without face-to-face interaction, must be analyzed with a very close lens to identify and control extraneous variables, especially in light of the remote learning setting. Many teachers and students



were not prepared to use the devices and applications that they were thrust into using when schools closed in March of 2020 (Rahiem, 2020).

Similar to applications, devices are also an important consideration to the educational technology implementation process for student growth. Bagdasarov et al. (2017), Bird (2009), and Ma et al. (2018), among others, have analyzed the different devices that can be used in the educational setting to promote learning, academic performance, and skill and social development. While there were mixed results, Bird and Ma et al. both noticed that previous exposure to using the devices impacted the growth students experienced; the previous exposure allowed the students to learn content rather than how to use the device. On the other hand, Bagdasarov et al. reported an increase in skill development but no significant difference in academic achievement. As technological skills are desired in today's workforce, it is important to help students along that journey. Today's employers expect individuals to be proficient with computers and applications to promote efficiency and productivity (Joynes et al., 2019). However, according to McManis and Gunnewig (2012) the use of technology should not be forced in the educational setting too early as it can impact the normal stages of development.

Even though studies about the use of technology to enhance learning have been conducted at all age levels in the educational setting and positive results related to academic achievement and performance have been found (Awuah, 2015; Bagdasarov et al., 2017; Bird, 2009; Ma et al., 2018), the need for more research is warranted after the Coronavirus-19 pandemic in order to understand how educational technology impacts students academically and personally. The purpose, knowledge base, and implementation of educational devices and applications has to be carefully analyzed in order to truly

enhance the learning process and promote greater academic achievement and skill development (Heimlich, 2015; Khan & Khan, 2020; Langford et al., 2016). The Coronavirus Aid, Relief, and Economic Security Act (CARES) grants have been focused on supporting learning loss even though educational technology was useful in educating students from home. There is a desperate need to fully understand the roles educational technology has in the traditional learning environment and with the skill development of students, so they are prepared for successful futures. While technology will continue to advance, education must catch up in better preparing teachers and administrators on how to implement the resources in order to best meet the needs of students and the new challenges the Coronavirus-19 pandemic has brought to the traditional classroom (Surkhali & Garbuja, 2020).

The Coronavirus-19 pandemic has brought the need for more research to be conducted to fully understand the impact educational technology has on students, especially when it is the primary mode of instruction. It is important to consider the academic growth and skill development of students, but it is as important to understand the personal and relational impact that has been made on the students. While technology can help with expanding knowledge, there are limits to the interpersonal interaction that can occur between students and teachers.

#### Purpose Statement

The purpose of the current study was to explore the perceptions of faculty in regard to the use of educational technology during the school shutdowns from March 2020 to June 2020. The study was placed specifically in a small, private K-12 Christian school in the Midwest with the overall purpose of increasing the awareness of the

changing needs of students, educators, and families and facilitate the needed adjustments to trainings, planning, and resources for future remote learning sessions.

### Significance of the Study

The current study is important for the contributions it will make to the field of education, specifically the education of rural, private school students in the Midwest. By examining the impact that the use of educational technology during remote learning had on student learning, especially in light of the Coronavirus-19 pandemic, this study addressed the educational technology training and curricular needs of teachers and students. The research study also addressed the impact the Coronavirus-19 pandemic created in the context of learning gaps and instruction with the use of educational technology through remote and hybrid classroom instruction. Along with addressing the training needs of teachers and the academic needs of students, the research study also addressed the social skills needed for students to be successful in their learning. Evidence provided by the research study will assist in recognizing the need for continued professional development for administrators and teachers in the use and implementation of educational applications and devices as well as the essential knowledge and skills needed by students to advance their learning through the use of educational technology.

Educators and administrators must be aware that students need background knowledge and skills in order to use educational technology to foster learning. Boevé et al. (2017) recognized the need to better understand student development in order to address the needs and benefits of using educational applications and devices. The current research sought to identify the needs for not only students but also teachers by analyzing

the implementation of remote learning using educational technology during the Coronavirus-19 pandemic.

### Population and Sample

The target population studied was the faculty from a small private K-12 Christian school in the Midwest. A total of six individuals from the private school were enlisted for their feedback through purposeful sampling (Creswell & Poth, 2018). All of the individuals were chosen because of their length of teaching in the traditional classroom, all having at least five years of teaching experience. The teachers participating also taught at the school prior to the school closures of the Coronavirus-19 pandemic, during remote learning, and after the transition back to the traditional classroom. Pseudonyms were used to protect the identities of the participants, and it allowed them to speak freely about their experiences. All individuals were invited to participate in the study regarding the use of educational technology specifically during the school shutdowns and subsequent remote learning through the Coronavirus-19 pandemic. The researcher also approached the school board of the small private Christian school to obtain permission to conduct research within the guidelines of the Institutional Review Board. Once permission was granted, data collection was completed by the researcher with the cooperation of the six faculty members of the small private Christian school through semi-structured interviews and archival documents.

A single building was selected from the private Christian school setting because it housed kindergarten through 12th grade. The study was conducted after the forced remote learning time during the Coronavirus-19 pandemic in which technology was enhanced at the school due to continued lengthy quarantine periods for both teachers and

students. During the time of the study, the technology at the school was expanded in which all students were equipped with a device at school. The school's technology plan provided that for the next two consecutive years, each incoming student would receive either a tablet, for kindergarten through second grade, or a Chromebook, for third through 12th grade. The researcher contacted teachers who had taught during the remote learning setting and continued teaching at the school after remote learning. It was made clear to the teachers that their bi-annual evaluations would not be affected by the data collection as an administrator would be conducting the research. Evaluations for the participants were also completed prior to the research taking place in order to take away the pressure of evaluating the participants' teaching. All of the teachers selected during sampling consented to participate.

Each participant first consented to the interview being recorded, via Microsoft Teams, and was reminded of his/her right to stop the interview at any time. Next, the interviewee was given the background of the study and instructions for the interview. The instructions set the stage for the interview to be relaxed and for the interviewee to answer each prompt with as much detail as possible. To help alleviate extraneous environmental variables, the interviews were conducted virtually with Microsoft Teams.

The participants in the study consisted of faculty members with at least five years of teaching experience. Each faculty member had not only interactions with students through remote learning but also through the transition back to traditional learning environment and the resulting challenges that are evident. As Yin (2003) suggested, interviews, documentation, and physical artifacts were additional sources of data that was compiled from the participants.

## Research Questions

The current study was designed because of the need to understand how remote learning impacted students. The combination of educational technology and the remote setting guided the development of the research questions. The study was directed by the following research questions.

1. How did changes in assessments during the school shutdowns of the Coronavirus-19 pandemic impact the reporting and analyzing of academic achievement?
2. How did the use of educational technology impact the skill development of students during the school shutdowns of the Coronavirus-19 pandemic?
3. How did the use of educational technology impact the social development of students during the school shutdowns of the Coronavirus-19 pandemic?

## Description of Terms

The following key terms are defined for the context and purpose of the researcher's current study.

*Academic achievement.* The grades or performance of a student (Steinmayr et al., 2014).

*Educational technology.* Any technological device or application that is used for instructional or assessment purposes (Tuma, 2021).

*Personal growth.* The perceptions of individual growth following challenges, especially relating to teachers and students (Tan & Andriessen, 2021).

*Remote learning.* Education in which the teachers and students are geographically separated (Torres & Ortega-Dela Cruz, 2022).

*Skill development.* Skills such as communication, fine motor, interpersonal, intrapersonal, organization, problem-solving, self-confidence, and focus capabilities, that students develop (Hill et al., 2019).

*Technostress.* Technology-induced stress (Essel et al., 2021).

*Traditional classroom.* A physical classroom with personal student-teacher interaction (Lorenzo et al., 2021).

### Summary

This chapter provided a basis for the study of educational technology during the current pandemic because of the impact it has not only on students and teachers today, but also the futures of both entities. Even though there have been studies focused on the use of educational technology outside of remote learning, there is a need to continue analyzing its impact since technology continues to advance and its use continues to take more of a place in the classroom especially with remote learning (Scherff, 2018). The case study approach will allow for a broad range of perspectives to be gathered through interviews. The interviews and subsequent case study analysis will add to the previous literature and provide a much-needed perspective in order to understand the changes that have occurred in educational technology within the context of remote learning since the start of the Coronavirus-19 pandemic. In chapter II, previous research will provide a foundation for the research study and allow for an understanding of technology and its impact in the educational setting.

## CHAPTER II: REVIEW OF THE LITERATURE

### Introduction

Educational technology continues to advance today, but the history with devices and applications began many years ago with simple devices like calculators. As technology advances in general so does the technology available to schools. Teachers have many tools and applications that allow them to enhance their instruction as well as keep in touch with their students and families. However, there are pros and cons to the implementation and use of educational technology which has implications for the future of education.

By addressing the role educational technology has in the educational setting today, teachers and administrators will be better prepared to address learning needs along with the challenges the Coronavirus-19 pandemic has brought to education (Topalska, 2021). Spector (2017) recognized that educational technology has a purpose of improving learning which in turn is difficult to analyze. Yet, learning is defined as a constant and consistent progress in knowledge, beliefs, and abilities (Spector). Regardless of the device or application used to promote academic achievement or skill development with the use of educational technology, teachers and administrators should be able to recognize characteristics of growth within the context of their students' learning.

Educational technology has been around for many years and in many different forms (Scherff, 2018). Early devices, such as calculators and overhead projectors, were



more predominantly used by educators, specifically in the classroom, with newer ones being available to both students and teachers (Arabie, 2015). From overhead projectors and audiovisual materials to computers and Internet, technology advanced greatly in the 19<sup>th</sup> century alone (Huang et al., 2019). With the continuous advancements occurring in technology, what people do will change (Huang et al.); jobs, daily tasks, and communication will be changed by the use of technology. Technology has not only become an important part of education, but it is an integral component of the work force. Technological skills are already important for many careers and will continue to push educational organizations to implement new technological devices and applications to stay up to date with the advancements (Huang et al.). The use of technological devices and applications is important to consider because teachers and administrators will change how education occurs, and it has already been impacted by the Coronavirus-19 pandemic (Exstrom, 2020).

With the advancement of technology and the push to utilize it for educational purposes during the Coronavirus-19 pandemic, primary educational settings have been challenged to incorporate devices and applications to enhance learning. Early studies focused on the impact the use of educational technology had on students' academic performance and found mostly favorable results (Awuah, 2015; Bhagat et al., 2016; Kardanova et al., 2018; Muis et al., 2015; Sookoo-Singh & Boisselle, 2018). Nevertheless, as technology continues to evolve, more recent studies have not only focused on the correlation to academic performance but also the skill development and perceptions of its use (Bhagat et al.; Chen et al., 2019; Ma et al., 2018). While the studies by Bhagat et al., Chen et al., and Ma et al. have developed a foundation for understanding

the implications of using educational technology, they also identify the need for continued research, especially after the challenges the Coronavirus-19 pandemic brought to schools and teachers. Educational technology and the modern classroom environment continue to transform. The transformation of the classroom environment calls for more studies to be conducted in order to better understand how schools and educators are preparing students for successful futures with the use of educational technology (Dunn & Kennedy, 2019). Many studies have discussed the impact educational technology has had on students' academic achievement, skill development, engagement, and other student-focused attributes (Awuah; Bhagat et al.; Chen et al.; Kardanova et al.; Ma et al.; Muis et al.; Sookoo-Singh & Boisselle).

#### Educational Technology and Academic Achievement

The Coronavirus-19 pandemic has pushed for educational technology to come to the forefront of the primary classroom setting because of school shutdowns and quarantines. Teachers and administrators have stressed changes that must be made in order to assess academic achievement due to standard assessments not being an option in the remote learning setting. Educational technology has been found to positively increase students' academic performance (Cetin et al., 2019; Crawford, 2010; Elfeky et al., 2020; Kazanidis et al., 2019; Kirkpatrick et al., 2018; Kisanjara et al., 2017; Lee, 2018). The use of educational technology in the classroom has been implemented in a variety of formats including virtual activities, flipped classrooms, one-to-one devices, and e-learning. Flipped classrooms combine traditional classroom instruction with a sense of remote learning as part of the students' responsibility is to investigate the given topic outside of the classroom.

Utilizing traditional instructional methods with the inclusion of educational technology as activities has promoted the growth of students and positively impacted their academic performance (Cetin et al., 2019; Crawford, 2010). The flipped classroom is a relatively new intervention in which the student drives their own learning, and the teacher becomes more of a facilitator. The flipped model of teaching also blends traditional and technological methods. In the flipped classroom model, the student is responsible for direct instruction through the use of technology while the classroom environment becomes more interactive with guidance from the teacher. Elfeky et al. (2020), Kazanidis et al. (2019), and Lee (2018) found that the flipped classroom also promoted the growth of academic performance. Erbil and Kocabaş (2020) found that the flipped classroom not only positively affected achievement levels, but it also promoted greater motivation for learning. He et al. (2019) similarly found the flipped classroom to be successful in its implementation, but their study showed that those students underperformed, were less motivated, and perceived the class as a lower quality class than the same class held in the traditional classroom setting. There are many considerations, including engagement and skill development, even when academic performance is fostered. The technology-based activities and the flipped classroom environment researched by He et al. has been implemented successfully to promote academic growth.

Dunn and Kennedy (2019) conducted a study on the usage and engagement of technology-enhanced learning in the flipped classroom. Dunn and Kennedy looked to assess the impact emotional, cognitive, and behavioral engagement had on academic achievement as well as how motivation levels predicted engagement. Dunn and Kennedy

along with Onivehue et al. (2018) found that underlying factors are often overlooked and intrinsic motivation had more of an impact on the use of technology as well as academic achievement. While educational technology was used, it did not replace traditional instruction; rather, it enhanced teaching strategies (Simelane-Mnisi & Mji, 2019). Many factors, like emotion, cognitive, and behavioral engagement, contribute to the growth of academic achievement.

Flipped classroom studies in high school have brought new insight to the impact the setting, traditional versus technologically-enhanced, has on academic performance. Bhagat et al. (2016) focused specifically on the mathematics flipped classroom. Bhagat et al. found that all levels of students were impacted, but those that grew the most were the low achievers. Not only did the students grow in learning and perform better, but they were also more motivated to learn and found it more enjoyable and effective (Bhagat et al.; Sookoo-Singh & Boisselle, 2018). Another study within the flipped classroom setting focused more on performance and student behavior. Within the research By Van Wyk (2018), students' study habits were analyzed in relation to their performance. Boevé et al. (2017), and Sommer and Ritzhaupt (2018) found that the flipped classroom did not have a clear correlation to how students studied or improved achievement.

Similar to the application of technology through activities and the flipped classroom, one-to-one initiatives with devices have been utilized as well. Kirkpatrick et al. (2018) found that the use of iPads for individual students had a slightly positive impact on academic performance. Likewise, Harris et al. (2016) focused on one-to-one technology but in the setting of a 4<sup>th</sup> grade classroom. The study by Harris et al. did not identify a pattern of positive effect on either the academic achievement or motivation

with the intervention. Another study in the elementary setting conducted by Walters (2012) reported similar results. However, Hale (2019) used web-conferencing to allow for synchronous meetings, which promoted engagement and ultimately academic performance. The use of real-time virtual meetings provided a more traditional classroom setting which incorporated student-teacher interaction and led to academic achievement and engagement in the subject matter (Hale).

Cell phone applications also play a role in one-to-one considerations. Ma et al. (2018) found that students scored higher on quizzes with the use of the cell phone applications than without. Even educational games were found to improve academic achievement and motivation (Partovi & Razavi, 2019). Despite the fact there are many positives, it is important to consider factors that pave the way for success. Qi (2019) recognized the need for guidance and training in the use of mobile devices to enhance learning and promote academic achievement instead of creating stress. Even the youngest of students, those in early elementary school, found a positive correlation to attitudes and academic learning with the use of one-to-one devices (Muis et al., 2015). Each of the methods of implementing technology does not take away the traditional classroom environment; the intervention of educational technology promotes the progress of academic performance, but more research is needed (Petersen-Brown et al., 2019; Thai et al., 2020).

### E-Learning

Yet, another mode of implementing educational technology completely replaces the traditional classroom. E-learning facilitates learning through electronic channels such as computers. Jaiswal (2020), Kisanjara et al. (2017), and Ünlü and Karataş (2016)

identify the e-learning mode of implementing educational technology as another way to enhance students' academic performance. Computer-based instruction, instruction that replaces the teacher as the moderator, has also held a role in the discussion. Khan and Khan (2020) found that computer-based instruction resulted in statistically significant differences in posttest and retention-test scores. Self-directed learning with technology increases engagement frequently, but Rashid and Asghar (2016) found that it negatively impacted academic achievement because there was not enough scripted direction; the students simply needed the guidance of a teacher. Students enjoyed using technology and were engaged while using it, but they did not learn enough to impact their overall academic achievement (Rashid & Asghar). Regardless of the mode used to administer educational technology, a positive impact on academic performance was correlated to its implementation.

While there have been many studies that have shown the use of educational technology to promote academic achievement (Bhagat et al., 2016; Chen et al., 2019), there are also some researchers who have found different results with the implementation of educational technology. Kardanova et al. (2018) found that devices and tools did not boost academic achievement. Through the study by Kardanova et al., elementary students were given devices that allowed them to use e-learning tools. Regardless of the new technologies and teaching aids used, there was no direct correlation to individual academic progress (Kardanova et al.). Many factors could have contributed to the results, including internet accessibility and connectivity, but those outlying factors will be further addressed in the next section (Kardanova et al.).

## Outlying Variables Impacting Educational Technology

The instruction that precedes the inclusion of technological applications and devices and their use has to be considered as well. The educational setting along with traditional pedagogy must be incorporated in order for background knowledge to allow for growth and improvement (Langford et al., 2016; Mohiuddin et al., 2019). Previous knowledge of devices and access to them outside of school is a factor for success in the larger scheme (Bird, 2009). When skills related to technology were evaluated, it was shown that prior availability to devices and applications raised scores (Bird). For educational technology to have the largest impact possible, students must have the skills and knowledge needed to not only use the application or device but also have a technological foundation on which to build (Touw et al., 2019).

Even beyond connecting prior knowledge and building a foundation to continue learning, teachers must also outline the choices students have in their own learning (McGuinness & Vlachopoulos, 2019). Choices can be included through the lesson planning process where teachers allow students to deepen their knowledge in certain areas of study. While there is direction from the teacher, students also drive their own learning to understand concepts they are interested in as well as those in which they struggle. Luo et al. (2019) described the impact various decision-making processes had on students' academic performance. According to Luo et al., even though students may enjoy control over their own learning, they still need to have structure and accountability, so growth is fostered.

The teacher and student each have roles in the educational environment, and those roles are comprised of personal attributes. Individual student attributes such as self-

control and self-motivation play a notable role in the success of the implementation of educational technology. Even though students may desire more control over their own learning, Luo et al. (2019) found that the most impactful learning environment was directed by the teacher rather than the students. Nurbol et al. (2020) found that many devices were useful in the learning process, but student attributes were associated with their academic success. In the research, the roles related to learning impacted the success of students as well as their skill development regardless of the technology implemented.

A specific attribute and skill of time management plays a large role in the success of the students (Basch et al., 2022). Baker et al. (2019) studied college-aged students and the development of time management skills as well as the impact the skill had on academic achievement. Using scheduling as a variable, the Baker et al. found that the students with the intervention scored better initially than those who did not receive the intervention, but the long-term effect was not statistically significant (Baker et al.).

A role that must be considered because of the impact that can affect students is that of a teacher (Suartama et al., 2021). Teachers, regardless of the mode of using educational technology, will still be driving the learning and development of units, classes, lessons, and other learning activities. Nazgul et al. (2020) studied the perceptions of preservice teachers regarding the use of educational technology in their classrooms. The study by Nazgul et al. found many teachers were not prepared to use technology for learning purposes. Even though they felt comfortable using technology for their own educational purposes, they were uncomfortable implementing educational technology as an instructional tool (Nazgul et al.). More professional development is needed in order for teachers to be able to identify and implement the use of technology for successful



application in their classrooms (Heimlich, 2015; Ruggiero & Mong, 2015; Williams et al., 2018).

A simple consideration must also include the curriculum that teachers use. Gabriel (2009) identified the importance of teachers bridging the gap in outdated curriculum with educational technology in order to make an impact on student development. In essence, teachers will impact the use of educational technology based on their comfort level with the applications and devices (Gabriel). The teachers' personal teaching methods will impact students' academic performance and skill development more than the use of educational technology (Gabriel). Ultimately, multiple variables in the educational setting can influence the academic performance and skill development of students besides educational technology (Kardanova et al., 2018).

#### Using Educational Technology

Individual student attributes play a large role in the success of the implementation of educational technology. Nurbol et al. (2020) found that many devices were useful in the learning process, but student attributes were associated with their academic success. Students must be engaged in their learning in order for teachers to implement educational technology effectively (Hollis, 2013). Likewise, typical skill development plays a large role in the success of including educational technology (Felix, 2018). With the inclusion of educational technology, the roles related to learning impact the success of students as well as their skill development regardless of the technology implemented (Felix).

Some teachers found that using educational technology for other reasons helped them to be more comfortable later on with more implementation as they had more experience with the devices and applications (Podorova et al., 2019). Podorova et al.

recognized that teachers must be equipped with technological knowledge in order to harbor the creation of 21<sup>st</sup> century skills. Teachers that used tablets for behavior management found that in the long term, they saw an increase in academic achievement (Chen et al., 2019). The tablets allowed for quick and accessible information that brought less disruption to the classroom. In essence, teachers will impact the use of educational technology based on their comfort level with the applications and devices because of their knowledge of technological devices and applications. Their personal teaching methods will impact students' academic performance and skill development more than the use of educational technology (Podorova et al.). Ultimately, multiple variables in the educational setting can influence the academic performance and skill development of students besides educational technology.

When the traditional classroom environment is disrupted, multiple variables also affect the social development and connectedness of students. Personal interaction is limited, and while the academic achievement and skill development can be fostered through the use of educational technology (Bagdasarov et al., 2017; Bird, 2009; Ma et al, 2018), the social relationships can lose focus as part of the learning process and environment. Many students simply struggled with socialization when learning was based through educational technology (Blahušiaková et al., 2021). Overall, face to face interactions have been more important for social development than the utilization of educational technology (Kayalar, 2021).

#### Impact on Skill Development

Skill development, both academic skills and social skills, is one area that has not been as extensively studied but is an important consideration for student growth and

success. Educational technology can not only guide students in developing 21<sup>st</sup> century skills, but it should also promote the growth of traditional skills. Along the same lines of previous topics, studies have found that educational technology can impact traditional academic, performance, and social skills. Collins (2018), Kirkpatrick et al. (2018), and Mohiuddin et al. (2019) found that there was no statistically significant correlation to skill development with the implementation of technology in the classroom. Simply put, the use of educational technology did not necessarily promote further growth of skills. However, Francis et al. (2019) did find that an online environment enhanced students' writing skills.

Awuah (2015) focused solely on the role Google Apps for Education (GAFE) has in the new age of education. The GAFE were successful in promoting students' academic achievement and knowledge base, but most students were already familiar with at least one of the apps making it an easier transition. The apps impacted their performance and must be considered in order to truly understand how prior knowledge and skills can be broadened and even specialized through the use of GAFE (Awuah). Because of the lack of positively correlated data, the impact educational technology has on skill development needs to be researched further (Surkhali & Garbuja, 2020).

#### Implementing the Use of Tablets

Another study focused on skill development specifically with the use of tablets, such as iPads or windows-based devices. Bagdasarov et al. (2017) analyzed the impact the use of tablets had on communication and critical thinking skills. Multiple classroom models were used as well including the flipped classroom, a tablet-based course with an e-book, and a traditional classroom setting. After studying the multiple classroom settings

and the impact of tablet use in each, the researchers found no statistically significant difference in overall grades nor the results between settings. However, the students recognized growth in oral, written, and graphical communication as well as critical thinking skill when reflecting on their assessments and experience with the implementation of tablets (Bagdasarov et al.). Elmaadaway (2018) also focused on skill performance but found that the flipped classroom environment was even more successful in increasing student engagement and skill development as opposed to one type of device.

Ultimately, the use of educational technology should promote skills that will serve students in their careers. Dunn et al. (2016) studied the impact iPad applications had on the life-readiness skills of students with disabilities. While the research by Dunn et al. focused on a specific subset of students, life-readiness skills are crucial to not only students with disabilities but also those looking to enter the workforce. It was found that the applications enhanced life-readiness skills to prepare students for success not only within their families but also in the workplace (Dunn et al.).

A specific skill needed all throughout life is writing. Nobles and Paganucci (2015) found that even an online format improved all areas of the writing process and skills because of the careful implementation of applications and personalized feedback. Even virtual reality systems have been found to increase creative skills as opposed to the traditional paper and pencil (Yang et al., 2018).

### Flipped Classroom Setting

While the flipped classroom has been positively correlated with academic achievement, Kong (2015) developed a study to analyze the impact it had on skill development. Critical thinking skills were expanded and as a result, led to growth in

academic performance (Kong). Likewise, Ravenscroft and Luhanga (2014) studied the impact the flipped classroom had on career skills. Interpersonal, communication, problem-solving, and critical thinking skills were all found to be improved and fostered within the flipped classroom environment (Ravenscroft & Luhanga).

Skill development is an area that requires more research in order to fully understand the impact educational technology can have as well as how to continue to foster growth for students' success. Future research will connect with the use of applications and devices in the classroom setting and recognizing instructional strategies as well. Academic performance should grow with new interventions in the classroom, but with the changing landscape of jobs and careers, traditional and 21<sup>st</sup> century skills must also be developed through the interventions, especially with educational technology.

With the focus on educational technology, researchers and teachers must carefully analyze the implementation of devices and applications. The continual development of technology will connect to the younger generations because the devices and applications are at their fingertips. It certainly can be noted that educational technology can enhance students' learning, promote academic achievement, and develop needed skills. However, there is a need to study the implementation strategies to outline the variables that truly impact the correlations. Because of the variable needs, the study will add to the previous literature by analyzing the use of educational technology in the K-12 school setting during remote learning along with the prior knowledge needed to not only promote academic achievement but also foster skill development and social interactions.

## Educational Technology and the Coronavirus-19 Pandemic

While devices and applications have continued to evolve in the educational setting, a new challenge arose with the Coronavirus-19 pandemic as the previously mentioned devices and applications became the classroom. The pandemic has brought new literature to the forefront regarding its impact on not only academics and skill development but also the social development of students along with the challenges teachers encountered.

Training and support have been a challenge for teachers previously as they not only need to know how to use the devices and applications they want to implement in their classrooms but they must also have the tools to instruct their students in utilizing the same devices and applications (Heimlich, 2015; Ruggiero & Mong, 2015; Williams et al., 2018). With the immediate change to remote learning, the need for systematic professional development that addresses educational technology in the classroom was evident (Abaci et al., 2021). The professional development must not just focus on utilizing technological devices and applications, but it needs to shift the training teachers receive to promote technology through pedagogy and teacher learning (Abaci et al.).

Educational technologists became invaluable assets in large educational institutions as they were able to support educators and students alike with the transition to remote learning. The educational technologists' knowledge of devices and applications allowed for little disruption to the teaching and learning processes (Simonson & Nethi, 2020). Without support of educational technologists, teachers struggled with preparing study materials because of the complex nature of the online format and cheating on assignments, tests, and exams (Blahušiaková et al., 2021). Teaching and assessing

methods were challenged, but ensuring students had access to materials was also a barrier schools encountered (Exstrom, 2020). More research is needed in order to understand the full impact of the immediate shift from in-person learning to remote learning, and that research can then be utilized in the training processes of educators along with professional development programs (Lockee, 2021).

#### Overall Effects of COVID-19 Pandemic

The Coronavirus-19 pandemic brought many challenges to schools and teachers, but students were also greatly impacted whether they were in kindergarten or graduating seniors. Students struggled to have access to technology that allowed for their learning to continue remotely (Exstrom, 2020). Some students struggled to have devices that allowed them to connect to the various online learning platforms while even more lacked access to the internet (Erickson, 2020). The accessibility and connectivity dynamic brings a challenge to teachers and students as they return to the classroom as some are beyond their grade level, some are at grade level, and others are below grade level (Erickson).

Students struggled with socialization as well. Similarly, many teachers found it difficult to receive quality assignments and produce quality assessments with the shift to the online format (Shilibekova, 2020). The virtual setting kept students from personal contact with their teachers and classmates, active learning and discussions, as well as better communication in general (Blahušiaková et al., 2021). However, some students did see an increase in skills with a remote learning setting. Students grew in their time management skills as that directly related to their academic performance in their classes (Baker et al., 2019).

Overall, researchers have suggested that primary and secondary schools should not rush to use the new educational tools after the experience of remote learning (Kayalar, 2021; McManis & Gunnewig, 2012). The tangible materials, small group settings, and face to face interactions are far more crucial to the success of the students rather than the learning objectives of each unit (Kayalar). Collaboration with other students and the human connection are irreplaceable within the virtual setting (Kayalar).

While primary and secondary schools were not equipped for the virtual classroom setting, colleges and universities were also challenged with the forced closure of campuses (Farsi et al., 2021; Khatibani & Tabatabai, 2021; Knox, 2021). Many degree programs utilize in-person clinicals, practicums, and the like as part of the education of students. The Coronavirus-19 pandemic brought a halt to preparation programs as well. Because of the instability and challenges that occurred during the pandemic, training programs for nurses found the need to implement planning, management, and technological training and inclusion into the professional development for educators and administrators facilitating the courses in order to address the remote setting challenges (Farsi et al.).

Some medical programs found that the pandemic helped in shifting teaching practices, but also challenged educators and students to meet standards (Khatibani & Tabatabai, 2021). However, the pandemic brought forth the need for new strategies to meet the challenges of the future and to invest in materials that allow for different platforms of learning (Khatibani & Tabatabai). Some even question whether the disruption that is caused by technology has any positive effects, especially in higher education (Knox, 2021). Electronic and remote education must be adapted in order to



supplement the changes to the in-person settings and provide the same educational experience (Alsoufi et al., 2020).

Similarly, the immediate transition to the remote learning setting brought a number of challenges (Ilieva & Yankova, 2020). The uncertainty of the learning environment not only affected the students but also administrators and teachers. While colleges and universities applied their learning management systems in order to not interrupt the education of the students, it was not a seamless transition for all teachers (Kayalar, 2021). The material still had to be prepared for a virtual setting and shared effectively to continue the robust educational environment of a college or university (Kayalar). Looking forward, education will be forever changed, and educational institutions must embrace technology and adapt it to the needs of everyone so learning can continue (Bloom et al., 2020; Camera, 2020; Ilieva & Yankova).

Regardless of the educational setting, one of the biggest challenges administrators, teachers, and students faced was navigating the emotional aspect of the sudden changes caused by the Coronavirus-19 pandemic. The unknowns took an emotional toll on everyone in education (Hartman, 2020). Schools questioned when they would close and re-open. Teachers struggled with navigating the use of technology, and some students wondered when they would have their next meal. While some of the mentioned challenges do not include technology, it identifies the void that technology cannot fill (Hartman) and supports the notion of the importance of adult contact on the success of students (McCorkell & Lobo, 2021) as well as the basic needs that need to be met in order to foster development in students (Bishop, 2016).

The previously mentioned challenges directly relate to the safe environment that students learn to expect at their school and within their classrooms. Joseph (2020) identified five key components that allow for the safe environment to be felt by students even in the remote setting. First, schools must address the digital inequity (Joseph). Many students needed access to devices and/or internet in order to make connections and continue learning. Hybrid learning is another important aspect to implement to help with the transition back to the traditional educational setting. When students could meet face to face with their teacher(s), anxiety levels were reduced and helped to foster relationships between students and teachers (Joseph). While teachers did their best to continue teaching their regular curriculum, it is important for them to be flexible. Because teachers have now encountered remote learning, in the future, they need to consider everything through a lens that allows for them to teach the same material remotely (Joseph; Kayalar, 2021). Likewise, the interactions students have with other students must be analyzed through a remote learning lens. While they may not be face to face, they will still be able to communicate and schools need to ensure bullying is not taking place, and the students can discuss hot topics respectfully (Joseph). Teachers need to recognize that the remote setting will affect students and their social-emotional learning. Making connections and allowing for adjustments to be made for assignments will help students to reduce their stress and recognize that their teachers are still there for them (Joseph). Focusing on those five challenges will allow for success to occur and students to feel valued, safe, and loved. However, it is not a long-term solution.

With the decrease in social activity and isolation, many students even in the university and college setting recognized a considerable effect on their mental health

because of the Coronavirus-19 pandemic (Orok et al., 2020). The mental health challenge then affects the learning that occurs and prevents the students from feeling safe, so there is a need for interventions to help reduce and treat the effect of Coronavirus-19 pandemic on mental health (Orok et al.). Even the primary and secondary school settings brought mental health challenges that both teachers and parents encountered (Santi et al., 2020). While teachers may have perceived self-efficacy for using educational technology, there are limitations that connect to the well-being of the students and their academic growth (Santi et al.). One strategy that could be utilized in the future for similar scenarios could be webinars. Webinars bring a sense of community through connecting, sharing, and learning with others while being physically distant (Sivers & Schnackenberg, 2021).

Similarly, there is a specific population that did not receive the support needed for academic success. Students with disabilities became disregarded in a large sense (Narvekar, 2020). While technology can meet some educational needs, it is not accessible to many learners with disabilities, especially those with complex learning needs (Narvekar) which in turn affects the development of their life-readiness skills (Dunn et al., 2016). Another consideration for students with special needs is a routine. Special needs learners require consistency and adequate support that is repetitive and individualized. Many teachers were not equipped to use technology nor provide materials and individualized instruction for students with disabilities which greatly impacted the academic success of those students (Kayalar, 2021; Narvekar).

Educational technology and remote learning brought many challenges to the educational setting. However, it would be remiss to not recognize the positives that did come through the challenging remote setting. Digital tools and learning management

systems allowed for collaboration and for learning to continue (Ilieva & Yankova, 2020). Without the devices and platforms, education would have had to stop. Similarly, streaming became an important aspect to connect families that were widespread. Very simple platforms can be used to share performances across the world (Kirk, 2021). Sick days and snow days may also become something of the past. With technology and remote learning capabilities, schools may not have to count snow days and instead continue with education in a different setting (Kirk). There is an unknown, exciting future that could be on the horizon for the connections that can be made because of the virtual component that technology brings (Lock, 2020). For example, foreign language requirements could be enhanced by connections across the world!

While there will be failures and success with challenges, important lessons are also learned. Remote learning has brought concepts such as how to present lectures and content, proctoring online tests, and facilitating discussions and interactions to the spotlight (Lumpkin, 2021). Pedagogical practices must be scrutinized in order to ensure they meet the needs of students in a variety of learning environments. Because of the challenges of remote learning, teachers, administrators, and support staff can be better prepared for future challenges that require remote learning (Lumpkin). Our educational society will continue to adapt to the needs of students, but reflective practices must occur in order to promote the growth from failures. Many institutions and governments need to improve the readiness of school personnel and institutions to facilitate successful distance learning (Topalska, 2021). By improving the readiness of both school personnel and institutions, both teachers and students will be served and equipped for success (Topalska). In essence, the teacher training programs must incorporate strategies to equip

teachers to be flexible, assess the needs of students, and support them in a variety of settings (Valverde-Berrocso et al., 2021).

#### Effects on Academic Achievement

Students' academic achievement growth was challenged during the Coronavirus-19 pandemic as the transition disrupted their normal routine and effort that was invested in their schoolwork (Motz et al., 2021). Meeting the needs of students was a secondary thought while schools and teachers scrambled to develop lessons that could be presented virtually (Kayalar, 2021), provide devices and connectivity to students in order to continue education (Kardanova et al., 2018), let alone measure the academic achievement being gained through the remote instruction (Kuhfeld et al., 2020). The challenge to meet needs of students was not exclusive to K-12 schools, as colleges and universities also had to adjust as quickly as possible (Motz et al.). Teachers looked to fill their remote learning with more activities and coursework in the attempt to foster academic achievement (Motz et al.). In general, more assignments were assigned during remote learning, but academic performance was not increased (Motz et al.) However, stress was increased (Kuhfeld et al.). Coupling more assignments and additional stress from remote learning attributed to gaps in students' education (Osborne & Hogarth, 2021).

Due to the pressures on schools and teachers to adjust their lesson plans to function in a virtual setting, more busywork tended to accompany the daily tasks students had (Motz et al., 2021). The busywork did not result in learning gains for all students, but some students still did make gains in areas such as reading (Kuhfeld et al., 2020). Kuhfeld et al. were able to compare similar situations with the COVID-19 setting. The settings included a traditional summer vacation, weather-related closures, and

absenteeism (Kuhfeld et al.). While the settings include planned and unplanned situations, some comparison can be made in order to analyze traditionally expected growth in academic achievement to the growth that took place during remote learning. The researchers found that students returning to school after remote learning were starting with only 63% to 68% of growth in reading and only 37% to 50% growth in mathematics (Kuhfeld et al.).

Even the college setting was disrupted, and students spent more time in learning management systems (LMS) in order to complete their coursework. The increase in both assignments and activities correlated to increased learning time, but their academic growth was not fostered positively (Khatibani & Tabatabai, 2021; Motz et al., 2021). Some students perceived remote learning coursework taking more effort, but the correlation to gains in academic achievement was not increased with the rise in effort (Motz et al.). Students reported lower scores and overall grades from the remote learning setting (Motz et al.). The disparity between the learning activities and assessments can be aligned to the abrupt transition to remote learning (Alsoufi et al., 2020; Motz et al.) because the teachers did not have time to adjust. Teachers did not have the tools needed to design online assignments let alone online courses to check for mastery (Farsi et al., 2021; Kayalar, 2021; Motz et al.). The teachers' focus was more on reaching students remotely and sharing information with them which led to a negative impact on their academic growth.

The change in the educational setting and the unknown of when normalcy would return would not be the only stress factor. Academic achievement was also found to be affected by technology-induced stress, or technostress (Essel et al., 2021). Chromebooks

and other devices became the classroom as well as the mode of communication for students and teachers alike. Not having the knowledge of how to use the device well only added to the stress of the remote learning period in education (Essel et al.; Langford et al., 2016). The immediate school closures forced new devices and applications on teachers and students alike which in turn impacted not only the teaching and learning process but also the stress of being able to learn through a Chromebook or similar device (Erickson, 2020; Exstrom, 2020). It is not surprising that Essel et al. found a negative correlation between students experiencing technostress and their academic achievement. The students' first task was to learn the device in which they were to learn through instead of receiving the content to learn (Essel et al.). In combination, remote learning and extra stress led to less productivity, less learning, and diminished academic growth (Essel et al.; Qi, 2019).

Even controlled studies without the impact of the forced school closure and subsequent remote learning has shown a negative correlation to academic achievement when learning occurs in an e-learning environment rather than the traditional environment. Onyema et al. (2020) studied the impact the e-learning platform had on students in contrast to the traditional classroom setting. They found that students scored different on posttests thus impacting their academic achievement and growth (Onyema et al.). Students in the e-learning group scored higher than the students in the traditional group. Likewise, students' interests were also affected by the virtual platform (Bhagat et al., 2016; Chen et al., 2019; Onyema et al.). The study gives insight into the planning that needs to occur on the front end of the implementation of a virtual platform in order to ensure academic growth. It is possible for e-learning to be successful, but the researchers

recommend that the transition to virtual platforms be gradual (Langford et al., 2016; Onyema et al.). Everyone involved must take the time to understand the new strategies and how to use it to its fullest potential (Langford et al.; Onyema et al.). Students also need to have needed digital skills to set them up for success which will allow them to be prepared for sudden changes to the learning environment (Onyema et al.).

Students require certain skills in order to successfully learn remotely in order to promote the growth of their academic achievement. Boshoff-Knoetze et al. (2022) studied self-regulation and the impact that skill had on academic achievement within the context of remote learning. When analyzing the final academic grades, students had not progressed as much during remote learning as when they were face-to-face in the traditional classroom (Boshoff-Knoetze et al.; Gabriel, 2009). Part of that is due to the remote learning setting and the emphasis put on the students to be self-motivated and self-regulated (Baker et al., 2019; Boshoff-Knoetze et al.). Not only was academic achievement affected but also the skill development of students.

#### Effects on Skill Development

Students in both K-12 education and post-secondary education were affected by the Coronavirus-19 pandemic and the remote learning that came with its closures. While academic grades were affected by the change in learning environment (Motz et al., 2021), skill development was also a consideration (Wickenhauser et al., 2020). Teaching strategies would not only affect overall content learning but also the development of skills. Without proper time to plan, students were behind in their skill development.

Wickenhauser et al. (2020) researched the impact specific assignments had on students in the remote learning setting. While one group completed the traditional



assignments for the course, the experimental group completed an additional five skill focused assignments (Wicknhauser et al.). The researchers found that the students in the experimental group, those with the additional skill focused assignments, had a greater increase in their intercultural competence than those in the control group (Wicknhauser et al.). While the experimental group had a planned intervention, it does show the potential for the success of remote learning, but planning was needed in order to address not only content but also skills when developing the learning environment, tasks and assignments, and assessments (Kim et al., 2021; Shi et al., 2022). If skills are to be developed through a remote learning session, research suggests that skill specific assignments can help to foster further development even through a virtual setting (Wicknhauser et al.).

In the 21<sup>st</sup> century, technological skills are important for students as well as for individuals in the workforce (Huang et al., 2019). With remote learning, 21<sup>st</sup> century skills were emphasized, and many students were able to foster and grow in their ability to self-direct, manage time, apply what they were learning, and in resilience (Jones et al., 2020). However, without face-to-face interaction and mandatory class sessions, some skills were weakened. Reflective thinking, communication, skills related to discipline, and connectedness were all lost to some degree (Jones et al.). Some practical skill development lost focus during the quick remote learning transition and other skills were not addressed through the various remote learning sessions (Bagdasarov et al., 2017). Both student and teacher feedback and interaction also made a positive difference in fostering skill development (Jones et al.).

## Effects on Social Development

The abrupt change to the learning environment not only impacted the knowledge and skills that are taught through the traditional classroom setting but it also effected students socially (Huang et al., 2019). Students no longer came to the school buildings or classrooms and instead logged on to virtual platforms via Chromebooks and other devices. School closures not only forced teachers and students to embrace the virtual environment as their classroom but also brought about separation and isolation (Yarberry & Sims, 2021). Physical contact was lost between teachers and students which in turn impacted student learning. Yarberry and Sims recognized the connection challenge, and through research, found the importance of virtual mentoring. Emotional support was crucial for employees and students alike when engaging through a virtual platform (Yarberry & Sims). Besides discussing content area tasks, it was important for a personal connection to be made through a simple dialogue. The dialogue fostered a sense of belonging and connectedness that is needed to foster growth and development (Yarberry & Sims; Basch et al., 2022).

While technology has had a place in the educational setting previously, the adaptations made during remote learning were made without preparation and reflection (Heimlich, 2015; Khan & Khan, 2020). When the occasional use of technology was the norm, the new standard made technology the only way for learning to continue. Because of the forced virtual setting, students appreciated the forced online communication with their peers and enjoyed the contact as opposed to the perceived isolation (Burke & Ločmele, 2021). Even though technology used for communication could be used

negatively, the students found they were building relationships regardless of geographical location (Burke & Ločmele).

Even with technology allowing for some connection, individual and group learning was still impacted by a social disconnect due to the forced closures of schools. Students need a collaborative environment both in the traditional and virtual environment (MacMahon et al., 2020). It is important for teachers, students, and parents to have access to resources to support interaction and connectedness during times of isolation to support both physical and mental health (MacMahon et al.). When relationships and interactions can be as normal as possible, both academic achievement and skill development can then be fostered as well. Effective digital resources must be identified and utilized in order to foster student connectedness (Basch et al., 2022; Hehir et al., 2021). Along with the digital resources, Hehir et al. found that the role and participation of the teacher was also an important component along with usability, immediacy, synchronicity, and community.

While there may be numerous resources available to help socially support students in a virtual environment, they must be analyzed so that they are easily accessible and usable for students (Hehir et al., 2021). Familiar applications allowed for students to feel comfortable participating in activities that fostered interaction and in turn fostered connectedness (Hehir et al.). Similarly, the students desired the participation or presence of the teacher. Even with the change in the environment, when a teacher was engaged through the applications being used, the students perceived the environment as more supportive and engaging (Hehir et al.; Muis et al., 2015). The connectedness and interaction through applications gave some semblance of the traditional environment and the interactions that would normally take place. It is also important to note that seeing the

teacher's face was even more powerful than just hearing his or her voice (Hehir et al.). Recorded videos even promoted positive feelings of connectedness and engagement (Hehir et al.). The active participation with the teacher was far more stimulating and fostered a positive environment for academic growth, skill development, and social development (Hale, 2019; Hehir et al.). When a video was not available, voice recordings were still preferred over text-based instructions or feedback. A personal voice still fostered connectedness as opposed to reading a message from the teacher (Hale; Hehir et al.).

Immediacy was another important component to the positive social development and interaction of students in the remote learning setting (Hehir et al., 2021). While videos and voice recordings promoted collaboration and connectedness, individual immediate feedback via email was preferred by students to foster that one-on-one relationship with their teacher (Hale, 2019; Hehir et al.). More detailed feedback was given in written form as opposed to the face-to-face or audio methods available. Delayed responses were one of the key factors describing a lower level of perceived connectedness regardless of whether the feedback was constructive or praising students (Hale; Hehir et al.; Rashid & Asghar, 2016).

Synchronicity, or real-time interaction, also promoted social development. The real-time settings allowed for the recreation of a physical experience as much as possible (Hehir et al., 2021) and fostered natural interactions as opposed to using artificial or delayed methods. If only text-based interactions were available, they were still viewed in a positive manner. Discussion boards helped create a sense of community and even

helped during the transition from remote back to the traditional learning environment (Hale, 2019; Hehir et al).

Collaboration and personal support can still be fostered through the virtual platforms which promotes connectedness and student satisfaction (Blahušiaková et al., 2021; Hehir et al., 2021). Overall, Hehir et al. found that students and teachers alike need some type of interaction in order to feel connected and reduce stress so that learning can still be fostered. Incorporating usability, teacher presence, immediacy, synchronicity, and a sense of community into the virtual environment promotes student connectedness and interaction which fosters social development and hinders isolation (Hale, 2019; Hehir et al.).

While social interaction is an important consideration with the remote learning setting, other factors can also help foster or hinder those connections. Two main factors were related to access and equity (Basch et al., 2022; Heitz et al., 2020). As the transition to remote learning happened without warning, many students were left struggling to find basic technology in order to learn remotely (Awuah, 2015; Heitz et al.). Initial interventions were not available, but after months of remote learning and still an unknown to the future educational setting and pandemic, grants and companies offered resources for internet access and equipment rental and purchases (Heitz et al.). Even though technology was the only mode for education to continue, basic needs also needed to be addressed (Bishop, 2016). The basics of food, housing, and money were difficult for low-income students on top of the resources for technology (Heitz et al.). Students struggled to provide for themselves and receive the resources they needed to live let alone learn. It is important to consider support services to address the basic and academic needs

along with the emotional and mental support that comes with closures and subsequent isolation from others (Bishop; Exstrom, 2020).

Another challenge that students encountered during the remote learning was a space to learn. Many students struggled to find a physical and psychological space that fostered learning (Basch et al., 2022; Bishop, 2016). Many functions were part of their home environment as adults transitioned to working from home. Along with the uncertainty caused by the abrupt change, additional stress was encountered with the chaotic environments at home leading to time management issues as well as difficulty sleeping (Basch et al.). Boundaries were difficult to set and maintain in order to alleviate the additional challenges (Erickson, 2020; Exstrom, 2020).

Faculty and staff also need additional support in order to adjust to the changing challenges of a remote learning environment. They too need direct support and to feel valued while trying to adjust and do their best (Heitz et al., 2020). Sharing information amongst teams and even online forums can help with their sense of connectedness along with providing a source of best practices and suggestions (Heitz et al.). The experiences with online forums, both good and bad, will inform administrators and teachers in order to better plan and provide training for future events that will disrupt traditional learning (Won et al., 2020). Incorporating as many traditional elements as possible to the remote learning environment can help foster growth in academic achievement, skill development, and social connectedness (Won et al.).

### Summary

The Coronavirus-19 pandemic brought a lot of challenges to teachers and students alike. Teachers had to adjust their lessons and communication to online platforms and

students had to transition to learning via Chromebooks and other devices. Students also had to manage various factors at home along with school tasks that added to their stress and in turn impacted their academic achievement, skill development, and social connectedness. Many factors, educationally and personally, must be considered with remote learning and the success of students academically, physically, and emotionally.

Educational technology is an important tool for the educational setting, but it must be used carefully. Without proper identification of devices and applications, developing specific guidelines, and outlining roles, the technology can become a placeholder rather than a source of growth. Creating a culture in which technology is used both at home and school, simulating remote learning in a way, can help bridge the divide that is visible today, especially after the forced school closure that led to remote learning across the nation (Zalaznick, 2020). Educational technology can promote academic achievement, skill development, and social interaction if it is fully understood and implemented in a way that is clearly outlined and focused (Zalaznick). It is important to understand the variables that correlate to the benefits and drawbacks of the use of educational technology in order to prepare our younger generations for successful futures by developing academic and social skills that will equip them to grow and succeed regardless of pandemics, remote learning, closures, and anything else that they may encounter. Chapter III will outline the qualitative methods that will be used for the current study.

## CHAPTER III: METHODOLOGY

### Introduction

The previous chapter provided a review of the impact educational technology has had on the educational setting and especially the changes that have occurred with the Coronavirus-19 pandemic such as remote learning. The concepts reviewed focused on the impact educational technology had on the reporting and analyzing of academic achievement, skill development, and social development. The use of educational technology can have a positive impact on students by increasing their academic performance and helping them to develop needed skills that are both foundational and 21st century skills (Bhagat et al., 2016; Chen et al., 2019). However, educational technology cannot replace the human interaction between students and teachers and has a different impact on social development of students which in turn impacts their academic performance and skill development (Lumpkin, 2021; Topalska, 2021; Valverde-Berrocoso et al., 2021). Alsoufi et al. (2020) recognized the need for adapting to the challenges the Coronavirus-19 pandemic brought to the educational setting through instructional practices and integrity. Studies have been conducted in educational institutions on educational technology and its role during the Coronavirus-19 pandemic (Abaci et al., 2021; Alsoufi et al.; Baker et al., 2019; Blahušiaková et al., 2021; Bloom et al., 2020; Camera, 2020; Erickson, 2020; Exstrom, 2020; Hartman, 2020; Ilieva & Yankova, 2020; Joseph, 2020; Kayalar, 2021; Khatibani & Tabatabai, 2021; Kirk, 2021;



Knox, 2021; Lock, 2020; Lockee, 2021; Lumpkin, 2021; McCorkell & Lobo, 2021; Narvekar, 2020; Orok et al., 2020; Santi et al., 2020; Shilibekova, 2020; Sivers & Schnackenberg, 2021; Topalska, 2021; Valverde-Berrocoso et al., 2021), but the review of literature identified that more research is needed in order to understand not only the academic but also the social and skill development of the students in the remote learning setting.

While the educational setting continues to encounter challenges and adapt to learning during the Coronavirus-19 pandemic, the study will add to the previous literature about education with technology and remote learning. It is important to take into consideration all of the learning challenges that have been stated previously but the social development of students must also be considered as well. This qualitative study will be conducted as a case study because it is a powerful design that allows for practical and theoretical goals to be analyzed (Yin, 2003). The research questions that will be answered through the collection of data will shed light on remote learning's impact on the educational learning environment during the Coronavirus-19 pandemic. The impact of remote learning will be analyzed through the reporting and analyzing of academic achievement, skill development, and social development.

#### Research Questions

The purpose of the current study was to explore the perceptions of faculty in regard to the use of educational technology during the school shutdowns from March 2020 to June 2020, specifically in a small, private K-12 Christian school in the Midwest in order to increase the awareness of the changing needs of our students, educators, and families. The study will also assist administrators and teachers to be better prepared for

future remote learning instances and to ensure that the students are continuing to develop for their futures. The research questions were:

1. How did changes in assessments during the school shutdowns of the Coronavirus-19 pandemic impact the reporting and analyzing of academic achievement?
2. How did the use of educational technology impact the skill development of students during the school shutdowns of the Coronavirus-19 pandemic?
3. How did the use of educational technology impact the social development of students during the school shutdowns of the Coronavirus-19 pandemic?

The remainder of the chapter contains the research design, the participants, and the data collection information. The methods used to analyze the data will be discussed in detail, explaining the process and purpose of each coding technique.

### Research Design

Previous literature has predominantly used a mix of qualitative and quantitative methods to examine the impact educational technology has had on the reporting and analyzing of students' academic achievement and skill development. The current study was designed and implemented as a qualitative case study in order to conduct an in-depth exploration of the Coronavirus-19 pandemic's effect on learning (Yin, 2003). The case study method allowed for a deeper understanding of the real-life experiences of faculty in the school setting during the Coronavirus-19 pandemic (Adams & Lawrence, 2019), and it also allowed for the inclusion of information regarding the transition from remote learning back to the traditional classroom with the challenges not only with that transition but also with the learning loss and gaps they are encountering with students (Abaci et al., 2020; Lockee, 2021). The case study approach allowed for a flexible collection of data

that could be adapted to each person being interviewed (Yin). The case study approach was also suitable for the study as it investigated a phenomenon in depth with real-life context in a bounded place and time (Creswell & Poth, 2018; Yin).

### Participants and Setting

The target population studied was the faculty from a small private K-12 Christian school in the Midwest. A total of six teachers from the private school were enlisted for their feedback through purposeful sampling (Creswell & Poth, 2018). Pseudonyms were used to protect the identities of the participants and allowed them to speak freely about their experiences. The teachers were invited to participate in the study regarding the use of educational technology specifically during remote learning through the Coronavirus-19 pandemic.

Within the private Christian school setting, a single building was selected due to it housing kindergarten through 12th grade. The study was conducted after the forced remote learning time during the Coronavirus-19 pandemic in which technology was enhanced at the school due to continued lengthy quarantine periods for both teachers and students. During the Coronavirus-19 pandemic, the technology at the school was expanded in which all students were equipped with a device at school. The school's technology plan provided that for the next two consecutive years, each incoming student would receive either a tablet, for kindergarten through second grade, or a Chromebook, for third through 12th grade. Teachers who had taught during the remote setting and continued teaching at the school after remote learning were contacted to be part of the current study. It was made clear to the teachers that their evaluations would not be

affected by the data collection as an administrator was conducting the research.

Evaluations for the participants were also completed prior to the research taking place.

The participants in the study consisted of teachers, all of whom had at least five years of teaching experience in the traditional classroom. Each of the teachers had not only interactions with students through remote learning but also through the transition back to traditional learning and the resulting challenges that are evident. As Yin (2003) suggested, interviews, documentation, and physical artifacts are sources of data that can be compiled from the participants.

A piloted interview session was conducted with a school staff member in order to test the questions and responses. After the pilot interview, the interview questions were adjusted to ensure that they would elicit responses that refer to and expand on the remote learning time of the Coronavirus-19 pandemic. The interview questions also addressed the impact educational technology during that time had on the reporting and analyzing of students' academic achievement, skill development, and social development or connectedness.

### Procedures

Each teacher consented to the interview being recorded, and they were reminded of their right to stop the interview at any time. Next, the teacher was given the background of the study and instructions for the interview. The instructions helped to set the stage for the interview to be relaxed and for the teachers to answer each prompt with as much detail as possible. To help alleviate extraneous environmental variables, the interviews were conducted virtually with Microsoft Teams.

## The Researcher's Role

In my experience as a teacher and now an administrator, I expect to find the limitations of educational technology more so than the benefits at the site. During the time of the pandemic and specifically the time frame of remote learning, I was teaching and not yet in administration. My experience teaching during remote learning could cloud my judgement, but the coding techniques chosen will allow for my experience to be excluded. With the current pandemic, the use of educational technology has propelled teachers to not only utilize a variety of technological devices but also multiple platforms for communication and learning. Even though there was not time to prepare for the disruption the Coronavirus-19 pandemic caused in the educational setting, the shift to complete dependency on technology during the period of remote learning was not widely accepted by students and families. Even though many forms of technology were available to everyone, there were still families that struggled to have devices for personal use let alone to be able to meet the needs of multiple family members required to use devices for remote learning each day. Likewise, not all families had access to internet which most devices require for streaming and to use educational applications. The challenges to have availability to devices and connectivity have only become more apparent because of the Coronavirus-19 pandemic.

Working with many of the teachers completing the interviews, I will have some prior knowledge of their experiences, but I will gain much more detailed information through the interviews. Similarly, my role as their evaluator has been completed previously and will not impact the interviews and the open forum for sharing of information. Formal evaluations have already been completed for all teachers that would

be invited to complete the interviews and do not need to be completed for another two years. My personal experience and opinions can certainly cloud my research and data collection but recognizing them now will help to form sound instruments and identify the areas of weakness prior to even beginning my formal study.

### Data Collection

Data was collected through one-hour, semi-structured personal interviews and recorded with Microsoft Teams over a 2-week period. During the interviews, prepared questions helped to guide the discussion, but the research questions also allowed for the teachers to openly share connections and their personal experiences (Yin, 2003). The interview questions can be found in Appendix A.

Along with the individual interviews, data was collected from archival documents (Yin, 2003). Documents related to educational technology at the site of the case study was collected. The archival documents included e-mails, purchase orders, meeting minutes, e-mails, and training information regarding educational technology. The archival documents showed precise information related to remote learning and the communication that was used at that time by faculty and staff (Yin). Likewise, the artifacts were used to compare and corroborate the information gleaned from the interviews in order to gain a robust view of the phenomenon (Creswell & Poth, 2018). Similarly, the researcher drafted analytic memos that allowed for biases and personal reactions to be analyzed and addressed throughout the coding process (Saldaña, 2016; Yin).

Data collection and storage was a consideration in order to ensure anonymity. Data was stored electronically on an individual computer that was locked with a

password only known to the researcher so the information remained confidential and secure.

### Data Analysis

The purpose of the research was to explore the perceptions of the use of educational technology during remote learning specifically on the reporting and analyzing of academic achievement, skill development, and social development. The data was collected with personal interviews and coded with multiple first cycle methods, specifically in vivo and holistic coding techniques (Saldaña, 2016). In vivo coding is derived from the data itself and utilizes the language that is used by the participants rather than codes that are researcher driven (Saldaña). In vivo coding allowed for the in-depth analysis of the topic of educational technology as well as the personal experience of the participant to be valued in the research process. Conversely, holistic coding will also be utilized (Saldaña). Holistic coding allowed for the experiences of the participants to unfold and show the general details of the phenomenon. Holistic coding allowed a single code to be attached to each large unit of data that captured a broad sense of the contents and categories that developed (Saldaña). The archival documents also played a role in holistic cycle of coding especially within the realm of the emails, purchase orders, and meeting minutes. The meeting minutes allowed for the unspoken or between the line information to come to light beside the interview and enhance what was already known about the remote learning topic.

The coding techniques utilized allowed for many words and phrases to be recognized as connected to educational technology. In vivo coding (Saldaña, 2016) techniques focused on the specific words and phrases the interviewee used to describe the

multiple facets of using educational technology during the Coronavirus-19 pandemic. While analyzing the interview, positive and negative words and phrases were identified and then broken down into themes related to the different people associated with the educational setting including teachers and students, the roles of faculty and staff, tools used in the classroom, and the impact of change.

Holistic coding (Saldaña, 2016) techniques allowed for the grouping of in vivo codes as well as the combination of codes from the interview with those related to the roles, tools, and benefits and drawbacks of using technology in the archival documents and many others. Time was spent reflecting and scripting analytic memos (Saldaña) to explain the importance of the holistic codes and how they were connected to the study of educational technology during the Coronavirus-19 pandemic. However, the analytic memos could show bias. Smith and Noble (2014) recognized that bias can interfere at each part of the process. It is important to understand one's view of the subject of study; that can be related in the analytic memos which will allow for the bias to be identified and dealt with intentionally. One must detach from preconceived notions in order to present a valid and reliable case study.

In order to present reliable and valid information, the participants of the study were debriefed with the information gathered and the option to view the final draft of the study to be published (Birt et al., 2016). Likewise, it was addressed in the study that the researcher spent an extensive amount of time in the field collecting data and experiencing the phenomenon. While presenting the findings of the study, only pseudonyms were used. No other identifying information was presented.



## Ethical Considerations

### Trustworthiness

Recording what the researcher sees and hears establishes the trustworthiness and validity of qualitative research. The components that facilitate trustworthiness are credibility, transferability, dependability, and confirmability (Stahl & King, 2020). Reflective journaling through analytic memos will be used to establish credibility for the qualitative research. The reflective journaling procedure will allow for analysis of the interview questions and thus promote the credibility of the responses to the research questions and the interpretation from the researcher (Stahl & King). Several interviews will promote the triangulation of the data collected in order to share the identified patterns as well as allow the researcher to receive feedback on the interpretation of what is being shared (Stahl & King). Using the previous literature, the interview responses through the study, and personal experience, readers will be able to compare and contrast the information. Confirmability and dependability will also be met by transcribing the interviews and then coding (Stahl & King).

According to Smith and Noble (2014), it is important to recognize bias in the research process. I fully understand their position, especially in the lens of data and data collection, but I became even more aware when they referenced that bias can occur at all levels of the research process. Bias in turn affects the validity and reliability of the study as a whole (Smith & Noble). It is important to understand my view of the subject of my study so I can begin designing a solid study, selecting participants that will not just support my own opinions, collect data that is free of bias and misinterpretation, and analyze the data in a way that shows the true case. Analyzing the data with the lens of bias will hopefully lead to a published study, showing that publishers are also unbiased

(Smith & Noble). Norris (1997) continued the thought by explaining how bias can intervene in each of the areas of the research process as well. He stated that “research demands skepticism, commitment and detachment” (p. 173). As a researcher, I must separate or detach from my preconceived notions in order to establish and conduct a valid research study. With ethical considerations in mind, it is crucial for me to consider my opinions and experiences and set them aside at each part of the research process.

Concerning data collection and storage, digital recordings of interviews will be stored on the personal laptop of the researcher. Only the researcher has the passcode to the device, and the recordings will only be accessible through the OneDrive connected to the researcher’s email address. Pseudonyms will be used in place of the participants’ names to ensure confidentiality, and the final research will be distributed to all participants for transparency.

### Summary

By following the above-mentioned procedures and methods, data will be collected for analysis. Interviews will aid in answering how school shutdowns of the Coronavirus-19 pandemic impacted the use of educational technology in the learning environment as well as how educational technology usage during remote learning impacted the reporting and analyzing of students’ academic achievement, skill development, and social development. Faculty feedback will also shed light on the support that was needed to facilitate remote learning and help to address future circumstances as well. Chapter IV will discuss the findings of the research.

## CHAPTER IV: FINDINGS

### Introduction

The previous chapter provided the methodology for the qualitative case study that was conducted concerning the use of educational technology during the school closures of the Coronavirus-19 pandemic. Reporting and analyzing of academic achievement and students' skill development were impacted by the use of educational technology in previous studies, but the social development of students must also be considered as well to truly understand the impact on learning. The purpose of the study was not only to bring awareness to the changing educational setting but also to help prepare schools for future remote learning settings. The qualitative study was conducted as a case study because it is a powerful design that allows for practical and theoretical goals to be analyzed (Yin, 2003). The remainder of the chapter will review the research questions that drove the interview questions, the participants of the interviews as well as the information that was gleaned from the participants, and giving feedback that will impact the future of education.

### Research Questions

The purpose of the research was to explore the perceptions of faculty in regard to the use of educational technology during the school shutdowns from March 2020 to June 2020, specifically in a small, private K-12 Christian school in the Midwest in order to

increase the awareness of the changing needs of our students, educators, and families.

The research questions were:

1. How did changes in assessments during the school shutdowns of the Coronavirus-19 pandemic impact the reporting and analyzing of academic achievement?
2. How did the use of educational technology impact the skill development of students during the school shutdowns of the Coronavirus-19 pandemic?
3. How did the use of educational technology impact the social development of students during the school shutdowns of the Coronavirus-19 pandemic?

### Participants

The target population studied was the faculty from a small private K-12 Christian school in the Midwest. A total of six teachers from the private school were enlisted for their feedback through purposeful sampling (Creswell & Poth, 2018). The six teachers were selected because of their history in teaching not only in the traditional classroom but also at the school. Each of the participants have multiple years of teaching experience prior to the school shutdowns of the Coronavirus-19 pandemic. The participants had also taught for at least one year at the school prior to remote learning and continued teaching there after the transition back to the traditional learning environment. Pseudonyms were used to protect the identities of the participants, and that allowed them to speak freely about their experiences. All individuals were invited to participate in the study regarding the use of educational technology specifically during remote learning through the Coronavirus-19 pandemic. All participants provided voluntary and informed consent.

The participants in the study consisted of faculty, all of whom were over the age of 18 years old. Each of the faculty members not only had interactions with students

through remote learning but also through the transition back to the traditional setting and the resulting challenges that were evident. As Yin (2003) suggested, interviews, documentation, and physical artifacts are sources of data that can be compiled from the participants, and all were utilized during the data collection process and are presented with the findings of the semi-structured interviews.

Each participant has over five years of teaching experience in the traditional setting. Participant one, who will be referred to as Kelly, has a master's in elementary education and has been teaching middle school for 12 years. During remote learning, she taught a combined class of fifth and sixth graders. Similarly, participant two, who will be referred to as Jenny, has a bachelor's in English and a master's in educational strategies. She has a long history teaching, a total of 14 years, of which have been primarily in junior high and high school English classrooms. During remote learning, she taught junior high and high school English classes along with a computers class and a Spanish class. Participant three, who will be referred to as Kristin, has two bachelor's degrees with some master's work. Her degrees are in psychology and elementary education with a reading endorsement. She has five years of teaching experience in elementary grades, specifically in kindergarten and fifth grade. She was a kindergarten teacher during remote learning. Participant four, who will be referred to as Bev, has a bachelor's in elementary education with endorsements for junior high math and history. She has taught at three different schools over a span of 15 years. She taught a combined class of third and fourth grade during remote learning. Participant five, who will be referred to as Janice, has a bachelor's degree in elementary education with concentrations in biology, health, and reading. She has over 20 years of teaching experience and has been teaching at the school

for 18 years. Janice taught kindergarten through 12<sup>th</sup> grade physical education as well as junior high math and science which were also the classes she taught during remote learning. Participant six, who will be referred to as Amy, has a bachelor's degree in elementary education with endorsements in reading and language arts. She has 10 years of teaching experience in both the general education classroom as well as resource. During remote learning, she was teaching second grade part-time as well as being the part-time elementary resource teacher.

## Results

### Background

The Coronavirus-19 pandemic brought immediate school closures and much uncertainty to K-12 schools across the United States, both public and private. The small, private school in the Midwest where the participants were employed was no exception. Even though they encountered a lot of challenges, many were able to recognize positives and help move their school forward in order to be better prepared for future instances. Funding from subsequent grants helped the school manage changes; however, the school closures had a lasting effect on the educational setting.

Meeting minutes and purchase orders reflected a challenge that the participants encountered – not enough devices for each student. Prior to the Coronavirus-19 pandemic, the small, private school had just started purchasing portable devices, a transition from desktop computers and labs; however, the school had not purchased enough devices to be 1:1. According to purchase orders, less than half of the students had access to an individual device at school prior to remote learning. Additionally, not all students had been assigned a school email address since they had not been utilizing

educational technology in their classrooms. The lack of use of educational technology in the classroom was especially true of those students in kindergarten through sixth grade.

Another takeaway from the meeting discussions was focused on how to adapt to the remote learning environment. Expecting students to be in front of a computer from 8:10 a.m. to 3:10 p.m. was not ideal nor possible as a majority of families had only one device, and that device had to be shared amongst the adults and the students. Because many families had to share a device between multiple individuals, adjustments to instructional time had to be made to the daily schedule. Similarly, the time allotments for each subject area had to be outlined. Students were now in charge of their own learning and reading, listening, or watching the lesson along with any practice and homework could span longer than the traditional classroom instruction and practice time. Teachers had to adjust their lessons and expectations in order to not overwhelm the students through the remote learning process.

Special meetings between administrators and teachers along with some school board members were held to discuss how to continue education after just one week of remote learning. Meeting minutes reflected that teachers had challenges connecting with their students as well as concerns they were receiving from parents. While the participants had some technology available in their classrooms such as Smart Boards/interactive boards, Doc Cams, and some Chromebooks, the immediate transition to teaching and learning remotely caused a lot of the participants to feel overwhelmed even if they were relatively comfortable with technology. The stress of the pandemic coupled with teaching and learning remotely was uncomfortable and making adjustments was challenging. Additionally, the unknown ending of remote learning impacted the

planning because there was always hope for returning to the traditional environment soon.

According to school board and faculty meeting minutes, those participants who were already using educational technology in their classroom, especially Chromebooks and having students interacting with different applications, were able to transition to remote learning more quickly. Teachers already using technology also had the advantage of reflecting more quickly on their method of delivery as well as lesson objectives in order to facilitate learning. Both the teachers and the students who were already using technology were able to continue learning in a somewhat similar way to what they had experienced in the classroom by utilizing Google Classroom. The initial transition was relatively straightforward, but as school closures were extended by the governor, the challenges grew. Teachers questioned how to continue teaching and connecting with each student, but they also questioned the end of the year parent-teacher conferences. Initially, the parent-teacher conferences were postponed with hope of completing them in person once schools were opened. However, the faculty meeting minutes reflected alternative plans once it was known that schools would not reopen to complete the 2019-2020 school year. Teachers were instructed to complete conferences via virtual meeting platforms such as Google Meet or Zoom with the fallback of phone calls.

After faculty and staff met to discuss the transition to remote learning and the challenges that were encountered at the end of the school year in-services in May of 2020, the school outlined guidelines for the remainder of the 2019-2020 school year. According to school board meeting minutes and school published emails, students in kindergarten through sixth grade were to work on two subjects for a maximum of 90



minutes per day; seventh through 12th grade students were to work on four classes for a maximum of three hours per day. Core classes, such as English/Language Arts, Mathematics, Social Studies, Science, and Bible, were to be worked on Monday-Thursday with Friday being a make-up and specials day. Specials classes included general music, choir, band, art, and physical education. Teachers were also to set office hours during which they were available to answer questions from students and families. Office hours were to span a five-hour window. The office hours were an important requirement so that families had the support they needed to assist their students during the remote learning setting. Likewise, the office hours were also crucial for the teachers, so they were able to help their own children at home with their educational tasks.

The education committee at the school met at the end of the 2020 school year in order to discuss the school re-opening plan for the 2020-2021 school year which included a recap of remote learning in order to address quarantine absences and possible school closures. It was referenced that it was important for the first in-services of the school year to address plans for transitioning to remote learning. Since there was no preparation time for transitioning to remote learning in March of 2020, teachers needed time to discuss plans and make plans for a shift so education was not disrupted. Part of the professional development needed to include how to make videos to present lessons to students as well as utilizing Google Classroom and other virtual resources purchased by the school and available to teachers and students. It was also important to adjust needed instruction for students to prepare for using devices and applications. All teachers needed to prepare lessons, instruction, and practice using various devices and applications in case schools were closed again due to the Coronavirus-19 pandemic. In all, the committee identified

the need for more research on outlining remote learning guidelines and expectations for both students and parents as well as how grading practices would also have to be addressed in order to not negatively impact high school students, especially seniors.

#### Impact on Reporting and Analyzing Academic Achievement

The first research question was: How did changes in assessments during the school shutdowns of the Coronavirus-19 pandemic impact the reporting and analyzing of academic achievement? The school closures brought challenges to teaching but also to assessments for all K-12 students during the pandemic. Traditional assessments, such as tests and quizzes, had to be altered drastically or were not used by the teachers. With the lack of traditional assessments used, reporting academic achievement was significantly impacted. The teachers reported only posting pass/fail grades rather than traditional letter grades and/or percentages. Faculty meeting minutes and personal interviews explained the grading and grade reporting challenge and the changes teachers had to make as they continued to adjust to the remote learning setting.

All participants were forced to adjust their modes of assessment because of the remote learning setting. The formative assessments to which the teachers and students were accustomed to check for understanding during the lesson were impossible to use because there was not the face to face interaction and everyone worked on their classwork at different times of the day, including the teachers. Summative assessments to evaluate how much the students learned and retained from the unit were also drastically altered. Changes came in the prompts that were used on the summative assessments because of the instruction that was given and the material covered. Basic prompts that addressed the lower-level thinking involved in the unit were the only questions that were

asked since higher order thinking supports were not available during the lessons and the skills were not developed. In turn, the change in assessments led to grades becoming pass/fail responses instead of traditional letter grades reporting academic achievement.

Participants Jenny and Janice both referenced the personalities of students as being a crucial factor in their academic achievement. Jenny specifically stated that those students who “had already established themselves as strong students with good study habits just continued with that. They already had a lot of the abilities to do that on their own, or they [had] a lot of support at home.” The students may not have been getting as much new material during the teaching/learning process with it being remote, but some were reported to have the skills necessary to be successful with old and new information alike.

Initial changes to assessments and grade reporting were described by Jenny. Within the first few weeks of remote learning, she had already made adjustments to her usual classroom grading. She stated that overall she was very lenient on when assignments were due, and she did not take off points for nor not accept late work as was typical for her traditional classroom setting. Many of the assignments that students turned in to her she corrected, but instead of giving them a traditional score for what was correct out of the whole, she recorded completion grades. The scoring was also adjusted; most of the assignments were fewer points than they would have been traditionally since they were more for completion than checking for skill development. Jenny also stated that she would give tests but would make them open book so that students would still keep in practice of study habits, but again, they were more for completion. As the remote

learning setting continued, completion grades became the norm which translated to pass/fail reporting.

Similarly, Bev and Amy said it was difficult to hold students accountable enough to give a letter grade. They would just recognize if the students tried because some needed more support and individual instruction which was not possible during that remote learning time period. Simply trying led to students losing ground academically and assessments not really taking place that allowed for a clear measurement of their learning or gaps. Bev also struggled to keep her students accountable. She stated that some students tried to complete tasks and assignments, but others just did not try because it was too hard without the direction of a teacher. The formative assessments were not there to provide encouragement, and many of the students needed to hear they were doing a great job. While written feedback was possible, the feedback that was normally given during worktime was not there.

Emails between faculty and staff as well as faculty meeting minutes relayed similar information from the school as a whole. Teachers struggled to assess students or really grasp what they understood. Not knowing if students received the right amount of support or clarification about the topic as well as if they received too much assistance from parents hindered the grading process, in turn affecting the reporting of the academic achievement negatively. Teachers, especially at the elementary level, decided to give participation points which translated into pass/fail for that final quarter of the 2019-2020 school year. As long as students had completed the tasks set before them during remote learning, they were promoted to the next grade.

Kelly and Kristin both commented on the beginning of the 2020-2021 school year, and the transition they saw from remote learning to the traditional learning setting. What was typically a review of previously learned material from the end of the previous school year was now introducing new material. The process was really slow because the pass/fail assessments from the remote learning time did not give specific information as to where the students were academically, rather, it showed that the students “did something” during remote learning. The pass/fail grades showed that the reporting of academic achievement is an important resource for teachers as they plan for classroom instruction.

The researcher’s analytic memos referenced a hesitation from the teachers during the grading and grade reporting discussion of the interviews. All of the teachers gave feedback that revealed a lot of confusion about how to grade and what to do when the teacher could not connect with the students or families regularly. Many of the participants were overwhelmed themselves because they were trying to complete their job as well as support their own children and families. The participants tried a lot of methods in order to best support their students, but some students almost made it impossible by ignoring emails, virtual meetings, texts and phone calls. Academically, it was very challenging to not only teach but also assess because the types of assessments that had been used in the traditional face-to-face setting were not effective. The limited communication and connection with the students made it very difficult to understand how the students were doing not only on a personal level but also academically. The participants seemed burdened by the challenges and all the methods they tried to promote learning in a somewhat normal way. There were a lot of disheartened comments especially about the

students who just simply avoided connecting with the participants. The teachers commented that they sensed students were depressed based on facial expressions during virtual meetings, words and phrases used during virtual meetings or through text, and the widening gap in communication.

### Impact on Skill Development

How did the use of educational technology impact the skill development of students during the school shutdowns of the Coronavirus-19 pandemic? Kelly, Kristin, Bev, and Amy all mentioned that at the K-6 elementary level, students did not gain but rather maintained the skills that they had learned previously. A lot of reteaching occurred at the beginning of the next school year, some of which included just simple procedures of how to conduct oneself in a classroom setting. Having to focus on those procedures took away from the learning process during the transition back to the traditional classroom setting.

Academic skills were also impacted. Bev referenced that students “just stood still on developing skills.” They practiced what they already knew, but new skills were not fostered because they lacked the face-to-face interaction that was needed to present the new material and build the students’ proficiency. One of the largest areas of concern mentioned was math; it was an area in which “they just [kept] practicing what they already knew,” according to Bev. Kristin stated that she “gave just a lot of activities that would maintain learning and maintain knowledge, but not hard concrete here is a new concept.” The only new concept challenges came with spelling words. Kelly echoed much of the same while also expanding on the impact she saw when they returned to the traditional setting. Since new skills were not developed and reviewing was taking place,

everything was moving a lot slower. Students needed to adjust to the traditional environment and get back into the habit of learning new tasks and building upon them.

Technology skills were definitely fostered through remote learning, however. All participants recognized a growth in using devices, learning new applications, and becoming more tech savvy due to connectivity challenges along with simply completing tasks before them without the direct help of a teacher. Jenny thought “it helped a lot of kids develop technology skills because they were forced into that.” However, she also shared all of the challenges that came with technology. There were connectivity problems, sharing devices, and time management skills. But, there was also the positive of having to be flexible and learning to address the problems in creative ways because of the remote setting. Even with creative solutions, Jenny found that “some of the academic skills deteriorated a little bit, because they weren’t getting more of the upper level kind of challenging questions.” She, along with the other teachers, focused on the basics since the students were on their own.

The researcher’s analytic memos highlighted the standstill that seemed to ensue with teaching and building new skills. The teachers commented negatively about the teaching process and again on how to connect with students in order to foster learning. A lot of uncertainty surrounded the skill development topic of discussion because the participants wondered how the future of the students would be impacted. The participants that worked with high school students were especially concerned about graduating seniors having the skills needed for college or careers. There were large challenges during remote learning as well as when schools reopened. A lot of academic and social skills had to be reviewed and taken at a slower pace during the transition back to the

traditional setting. The participants were concerned with future school closures and how to combat the issues and challenges that were part of the school closures and subsequent remote learning settings in the spring of 2020.

### Impact on Social Development

How did the use of educational technology impact the social development of students during the school shutdowns of the Coronavirus-19 pandemic? Socially, all of the participants saw a negative impact at least at one point throughout the remote learning time period. Not being with their peers nor having their routine brought a lot of negative feelings to the surface and deterred students from keeping connections with their classmates on top of connectivity issues related to internet and device availability. Kelly referenced that it was “socially and emotionally hard.” There were a few students who thrived and even communicated more with their teachers, as referenced by both Kelly and Jenny. However, Kelly and Jenny also stated that students in general seemed to be more introverted. Google Meets were extremely helpful during the remote learning time to help the teachers and students connect but also just the students. Jenny said that when she would set up Google Meets, almost everyone participated because they craved that social interaction. Kristin also used Zoom, since it was free during remote learning. She “saw students yearning for connection.” So, they tried their best by having Zoom show and tell. However, even the virtual setting had its drawbacks. Janice still saw the difference since it wasn’t face-to-face, and Amy said “the kids who are more prone to depression, you could just see it.”

Upon the students’ return to the traditional classroom setting, re-learning rules, procedures, and behaviors were part of the transition. Kelly found that the students



seemed “meaner” especially related to the words that came out of their mouths. They seemed to struggle with being appropriate and interacting with their peers in a positive manner. Kelly “dealt with a lot more of the bullying type behavior” upon their return to the traditional setting as opposed to before the school closures. Kelly stated that she spent more time dealing with bullying type behavior because the students were no longer behind a screen or keyboard. A lot of time was spent on how to interact and act in the traditional classroom as well as how to address students’ peers. When the students were behind a screen or keyboard, they didn’t necessarily have the visual connection or the visual impact of their words. Kelly found that the students were ruder to each other, because they could type the words during remote learning without immediate feedback and negative consequences. In the traditional environment, students would tell a teacher about negative interactions, and it would be handled by the teacher or administration. However, the reporting by students was challenged with remote learning because of the distance, and as Kelly shared, students fostered more bullying-type behavior.

#### General Takeaways from Remote Learning

Kelly recognized the challenges of remote learning, especially with the lack of devices the school had for students to take home. That made it difficult to not only teach but also connect with her students. To her, the main drawback was not being able to see her students. “Even just watching them work and being there,” was something that was missed. She couldn’t see their faces nor really check for understanding through the teaching process which in turn made it very hard to assess as a teacher. The process of teaching, learning, and assessing was lost, and only the final product was given. Kristin also stated that the main drawback for her was not having contact with students. When

she did have the opportunity to connect with one particular student over the phone, Kristin could tell emotionally the student was getting worse and worse. Not being with people really impacted her negatively. Similarly, Bev said the main drawback for her was not being able to be there to help a student or parent struggling. Many struggles came with the remote learning setting which hindered the support and in turn affected the outlook of all involved. Amy took it one step further in recognizing that the general outlook of students was sadder or depressed because they lacked the face to face interaction, their friends, and their routines.

The collaborative environment was also noted as a drawback from Jenny, addressing common errors for the entire class took a lot more time and explanation which was not anticipated. Janice echoed that sentiment along with not really knowing if the students grasped the concepts being taught or the feedback given. Many students struggled to maintain contact, so getting their feedback was also hard to keep the learning process moving as if it was in a classroom setting.

The researcher's analytic memos highlighted that there seemed to be a perceived disparity between public and private schools from the participant's perspective as the teachers commented on not having devices provided by the school as well as tools for the teacher to use to facilitate remote learning. Many of the participants praised the forced remote learning setting for making the school administration and school board, along with the teachers and parents, aware of the changes that had to be addressed sooner rather than later. While some participants did not want to incorporate technology into their classroom, it was now not a question that it needed to be part of the traditional setting in

order to keep up with the current culture and be better prepared for future remote learning settings.

### Summary

While many of the takeaways from the remote learning time period of the Coronavirus-19 pandemic were negative, there were some positives that will allow for a better future for students and their academic futures. Chapter V will discuss the conclusions and recommendations of the research.

## CHAPTER V: CONCLUSIONS

### Introduction

The purpose of this qualitative case study was to explore the perceptions of faculty regarding the use of educational technology during the school shutdowns of the Coronavirus-19 pandemic. The study was placed specifically in a small, private K-12 Christian school in the Midwest with the overall purpose of increasing the awareness of the changing needs of our students, educators, and families and to facilitate the needed adjustments to trainings, planning, and resources for future remote learning sessions. The chapter includes a discussion of the major findings as related to the literature on the use of educational technology in the classroom and remote learning along with its impact on academic achievement, skill development, and social development. The chapter concludes with a discussion of the delimitations and limitations of the study and recommendations for future research.

### Summary of Findings

Through the semi-structured interviews, themes emerged about remote learning and its impact on academic achievement, skill development, and social development. Faculty perceptions were overall negative toward the remote learning time period of the school shutdowns during the Coronavirus-19 pandemic, but some overall positives also came from the experience that will help in future scenarios. Students were impacted negatively. The students' academic achievement was no longer assessed nor reported in a

traditional manner, and their skill and social development stood still. On the other hand, some relationships between teachers and students were strengthened because teachers just wanted to connect with their students. During remote learning, the connection between students and teachers became the priority for most as opposed to continuing the learning process. Because of the remote setting, sometimes talking about what was happening with education, with families, and with the pandemic took precedence over the teaching and learning of a lesson. Another positive was that technology was available to continue education, and the teachers were able to gain more tools to use in the future. In general, remote learning had a notable impact not only on students during remote learning while schools were closed but also for the future of education.

The first research question addressed the affect the changes in assessments during the school shutdowns of the Coronavirus-19 pandemic had on the reporting and analyzing of academic achievement. Regardless of grade level, the participants all referenced a change in grading procedures. Formative assessments were no longer used and summative assessments had to be changed drastically. Higher order thinking prompts could not be part of the assessments because the students lacked the support they needed to develop the skills to be successful on traditional assessments. Not only did the questions asked change, but also the format. Online quizzes became more of the norm, and they included more multiple-choice options as opposed to paragraph responses. Analyzing the assessments was also impacted as grading scales became more obsolete and pass/fail or participation took its place. Overall, remote learning negatively impacted the assessment of students which in turn undesirably impacted the reporting of their academic achievement.

The second research question addressed the impact on the skill development of students during the school shutdowns of the Coronavirus-19 pandemic. Again, regardless of grade level, the participants referenced the students “standing still.” Because of the immediate shift to remote learning, new content was not presented as both the teachers and students were not able to access internet or devices. Not presenting new content in turn led the teachers to help maintain where their students were with skills by practicing what they had already learned in the 2019-2020 school year. Instruction, assignments, and assessments focused on the skills students already possessed, but new academic skills were not gained. Most if not all of the material that would have been introduced in the fourth quarter of the 2019-2020 school year was never addressed or presented because of the remote learning setting. But, because of the abrupt shift to remote learning, students were forced to develop or grow their 21<sup>st</sup> century skills in using technology. Even if students did not want to type or use technology, they had to use some type of technological device in order to complete tasks and connect with their teachers and peers.

The third research question addressed the impact on the social development of students during the school shutdowns of the Coronavirus-19 pandemic. The general consensus from the participants was that students also struggled to connect socially. Isolating at home and a lack of connectivity related to internet access and device availability led students to become more withdrawn and struggle with face-to-face interactions when they were able to be together.

### Discussion

The use of technology in education has shown to have both positive and negative impacts on students academically and developmentally. Previous research has looked at

the use of educational technology in the traditional classroom and how its use impacted the students' academic achievement, skill development, and social development. The purpose of the research was to explore the perceptions of faculty in regard to the use of educational technology during the school shutdowns from March 2020 to June 2020. The study was placed specifically in a small, private K-12 Christian school in the Midwest with the overall purpose of increasing the awareness of the changing needs of our students, educators, and families and facilitate the needed adjustments to trainings, planning, and resources for future remote learning sessions.

#### Impact on Reporting and Analyzing of Academic Achievement

The first research question was how did changes in assessments during the school shutdowns of the Coronavirus-19 pandemic impact the reporting and analyzing of academic achievement? The responses gathered from the participants of the study contradicted some of the findings of previous literature. While there are some favorable results about educational technology's impact on academic achievement (Awuah, 2015; Bhagat et al., 2016; Kardanova et al., 2018; Muis et al., 2015; Sookoo-Singh & Boisselle, 2018), the remote learning setting proved to have a notable influence on assessments and in turn the reporting of academic achievement. Traditional teaching methods and settings enhanced by educational technology positively impacted the academic performance of students, but when technology replaced the traditional classroom, academic achievement was negatively impacted. The current study reported that academic achievement was not easily assessable as traditional methods of assessment were not capable of being used and grading practices followed a pass/fail process. In turn, the academic achievement of students was not easily analyzed during remote learning.

A major takeaway from previous research is that academic performance was positively impacted by the combination of educational technology and traditional instructional methods (Cetin et al., 2019; Crawford, 2010). Even though the flipped classroom brought a remote classroom aspect to the forefront (Elfeky et al., 2020; Kazanidis et al., 2019; Lee, 2018), the combination of educational technology in the traditional classroom setting made the difference with promoting educational experiences and academic achievement. The traditional classroom and teaching methods allowed for assessments to continue in a typical way. Both formative and summative assessments were used as opposed to that of the remote learning setting.

Computer-based learning studies, where instruction from the teacher was replaced by technology, can be compared to the remote learning setting as well. Jaiswal (2020), Kisanjara et al. (2017), and Ünlü and Karataş (2016) reported that computer-based learning enhanced students' academic performance which contradicts the current study. However, the previous studies did not involve an unplanned shift to remote learning. Rather, the studies showed that careful planning had to take place in order for technology to replace the classroom instruction (Jaiswal; Kisanjara et al.; Ünlü & Karataş). The participants in the current study reported that computer-based learning where technology replaced the teacher and the classroom did not enhance academic achievement. Assessments were greatly altered and the remote learning setting did not allow for teachers to properly teach nor assess students' content knowledge with the rapid shift to remote learning. Rashid and Asghar (2016) found that computer-based learning negatively impacted academic achievement because of the lack of scripted direction. The study by Rashid and Asghar aligns more with the findings of the current study since the



teachers struggled to connect with students, teach, and assess them during remote learning.

The previous studies by Jaiswal (2020), Kisanjara et al. (2017), Rashid and Asghar (2016), and Ünlü and Karataş (2016) compliment the current study by drawing the comparison to the educational settings. Traditional settings that utilized educational technology saw more positive correlations to the variable of academic achievement. Remote learning brought a new challenge to the educational environment that impacted both teachers and students. In general, remote learning challenged the methods teachers used to teach and assess. Typical classroom instruction was no longer face to face, so formative assessments had to be adjusted which in turn also impacted the summative assessments. Because of the changes to the style of assessments, teachers also had to modify how to report the students' academic achievement. While previous studies reported an increase in academic achievement in the traditional classroom, the current study found that the reporting of academic achievement was challenged and changed in the remote learning setting, so an increase or decrease in academic achievement was not able to be described (Jaiswal; Kisanjara et al.; Rashid & Asghar; Ünlü & Karataş). The overall impact of the use of educational technology during remote learning on the recording of academic achievement will likely be seen in the years to come because of the change in grade reporting.

## Impact on Skill Development

The second research question was how did the use of educational technology impact the skill development of students during the school shutdowns of the Coronavirus-19 pandemic? Previous literature has reported mixed results from studies analyzing skill development after the implementation of educational technology. The same can be said of the current study. While Awuah (2015) reported that Google Apps for Education promoted academic achievement and skills, it was noted that the students were already familiar with that application which allowed students an easier transition for the learning process. The familiarity with the application is an important consideration as the participants of the current study also mentioned familiarity as a variable in their responses. It was a sharp learning curve for both the teachers and the students to transition to remote learning, so they had to learn new ways to teach and learn remotely. Technological skills were learned or expanded upon due to the remote learning setting. However, traditional academic skills followed suit with the academic achievement, holding still from when they left the traditional environment. Likewise, the participants reported that they did not try to teach new skills, rather they focused on maintaining the skills the students already possessed along with simply connecting with them on a personal level in order to stimulate some type of normal interaction.

Specific skills, such as writing skills, have been impacted positively by educational technology (Francis et al., 2019). However, multiple studies did not find a correlation between the use of educational technology and the development of skills (Collins, 2018; Kirkpatrick et al., 2018; Mohiuddin et al., 2019). Similar to the current study, there is not a statistically significant correlation, positively or negatively, to overall

skill development. It is important to recognize that the participants in the current study did not present new information to students in order to build new skills. Rather, the teachers provided activities that fostered the practice of skills that had already been presented in the traditional classroom setting.

Technological skills were fostered by the remote learning setting because of the dependence on educational technology to facilitate the learning and take the place of the traditional classroom. Studies by Bagdasarov et al. (2017) and Elmaadaway (2018) found that engagement and communication skills were fostered by the use of educational technology. Ravenscroft and Luhanga (2014) found that interpersonal, communication, problem-solving, and critical thinking skills were fostered with the flipped classroom environment. The flipped classroom environment combines the traditional classroom with the use of educational technology, so direct interaction and instruction is provided by teachers before students use educational technology. Remote learning was implemented suddenly, so skills that were needed for using educational technology had to be developed by the student individually. The participants of the current study had to not only prepare themselves to use new devices and applications but also adjust to the devices to which their students had access. There was no time to prepare students in the traditional environment because of the abrupt shift to remote learning.

#### Impact on Social Development

The third research question was how did the use of educational technology impact the social development of students during the school shutdowns of the Coronavirus-19 pandemic? While many previous studies did not specifically discuss social development in detail, Collins (2018), Kirkpatrick et al. (2018), and Mohiuddin et al. (2019) reported

in the studies no statistically significant correlation to social development with the implementation of technology in the traditional classroom. More recent studies, those investigating the remote learning setting, have recognized social skills more thoroughly by analyzing interactions between individuals and receiving feedback on their perceptions (Huang et al., 2019). Since teachers and students no longer met in school buildings, the interaction between them had to occur over some type of virtual setting. Connectivity and availability proved to be challenging for many families and significantly contributed to social interaction. Many students became isolated, and students and teachers both needed emotional support (Yarberry & Simms, 2021).

The social disconnect brought by the forced school closures changed the environment in which students learned. The typical collaborative environment was now challenged. Regardless of whether they were in the traditional classroom or remote, students need to collaborate (MacMahon et al., 2020). The participants of the study shared the challenges they had connecting with the students themselves along with the students interacting with each other. As the remote learning time continued, the participants set aside time for students to simply talk with each other and see each other through virtual means. The virtual meetings allowed for some social development to be fostered, but many students still struggled to maintain normal interactions with their peers.

Many factors contributed to the downward spiral, mentally and emotionally, that participants of the current study noticed. Accessibility was the main factor mentioned by the participants of the current study which correlates with the study by Hehir et al. (2021). Familiar applications allowed for students to connect and have a sense of comfort

because it was not all new (Hehir et al.). Other factors that contributed to the lack of social development came because of the struggles to be on similar schedules. Likewise, families with only one device had a difficult time scheduling in order for each member to use it for either work or school.

Another factor mentioned by the participants of the study were the unknown regulations and time frames. Teachers and students alike did not know when the school shutdowns would end or when families would no longer have to quarantine. Not having an end in sight caused a lot of anxiety and depression to surface because of the difficulty for students to connect to their friends and teachers. Hehir et al. (2021) found that teachers and students alike needed interaction in order to feel connected. The participants of this study corroborated that finding from the previous study. The student-teacher interaction not only allowed for collaboration, but it also helped the participants feel more at ease. They were able to see their students and pour love and compassion into them because they were worried about many of them emotionally, replicating the traditional setting virtually. The stress was lessened because of the use of educational technology, at least to some extent because of audio/video virtual connections.

In general, it is important for everyone, teachers and students, to be connected and collaborate in order to feel connected. The connection and collaboration can be in person, but it can also be virtual. Educational technology can make it possible, but everyone must have access to a device in which they can virtually connect.

## Implications

### Theoretical Implications

The current study expanded on the previous research concerning the use of educational technology especially within the context of remote learning, a new setting for education. Because of the ongoing advancement of technology, education will continue to be impacted by new devices and applications. Similarly, the forced school closures and subsequent remote learning settings have also opened the door to future events to help keep the learning process moving forward during a pandemic or similar world event. However, as the current study indicated, more preparation is needed in order to ensure that students can be assessed to promote growth in academic achievement, continue developing new skills, and stay socially connected.

As a result of the study, school districts and even college/university teacher preparation programs can adjust their professional development and course requirements to include training related to not only using educational technology but also formulating lessons that can transition from the traditional classroom setting to the virtual, remote classroom. Likewise, school districts and teachers will be able to address assessment practices in order to foster academic, skill, and social growth regardless of the classroom setting.

### Empirical Implications

While previous studies have shown that educational technology can enhance the learning environment and process for students and teachers, the remote learning setting has identified the weaknesses for those without access to internet and/or devices. If students are unable to access the internet or have a device to work from, they are not able

to continue learning in a remote setting. That in turn affects their academic achievement, their skill development, and their social development.

The current study showed that connectivity and accessibility issues coupled with inexperience with devices and applications can hinder the educational process in the educational setting. Training and preparation are key factors to utilizing devices and applications to continue learning but having the devices and internet available to everyone is essential first and foremost.

### Practical Implications

In general, the current study shows the importance of adjusting to and learning new technology as well as making it affordable and available to everyone. In order for education to continue in a remote setting, everyone must have the same opportunity to succeed. Possessing the same opportunities as others was not the case for the participants in the study, but it is an important consideration for future events. Technology is here, and it is here to stay. It is time to embrace it and use it to its fullest extent.

### Delimitations and Limitations

#### Delimitations

The boundaries of the current study were limited to only including teachers of a small, Christian school in the Midwest. The choice of one group was to limit the perspectives to one aspect, that of a teacher, instead of gleaning information from other adults or even students. Similarly, a case study was chosen in order to get an in-depth examination from a group of people rather than designing a phenomenological study. The case study allowed for a broader analysis and more detailed, vivid language to occur rather than just the participants' lived experience.

## Limitations

The sample used in the study was one of convenience. All participation was voluntary and consisted of informed consent within one small, private Christian school. The study included a small sample and was limited by the aspect of one site being used.

The researcher's role as an administrator during the collection of the data could also be labeled as a limitation. While there were clear expectations outlined, no teaching evaluations were given during or after data collection so there would be no pressure about sharing their teaching practices as their teaching practices were not being evaluated. Teacher evaluations must be conducted for state reporting every two years, and all the evaluations were completed in the 2021-2022 school year. The individuals voluntarily participated, however, the researcher being in a position of authority could have hindered participants from sharing all information especially in relation to their teaching and students' success.

Another limitation can be discussed within the realm of coding techniques and the data gathered. While multiple coding techniques were used, even more methods, such as concept and emotional coding, could be employed to develop a robust understanding of the remote learning during the Coronavirus-19 phenomenon. Likewise, more forms of data, such as interview with students and parents, would allow for a deeper and well-rounded understanding of the topic and allow for multiple perspectives to be brought to the forefront.

In reference to the participants of the study, a limitation was asking them to reflect on their experiences from remote learning which was now removed by a couple years. While some remote learning has taken place because of quarantining procedures in



the past two years, it was not the same as the forced school closure and complete remote learning of all students due to the Coronavirus-19 pandemic.

### Recommendations for Future Research

Considering the findings, delimitations, and limitations of the study, it is recommended that future researchers expand their participants to include both parents and students in order to gain a more robust understanding of the remote learning setting. The inclusion of parent and student perspectives would allow for even more analysis on how to better equip the educational setting for remote learning as well as how to adjust the traditional setting to include that preparation. Parents' perspective would give the family perspective of the remote learning setting and bring another aspect to the forefront which could also impact the educational setting and preparation of teachers for remote learning. Multiple sites could also be used so that a general region could be better analyzed, and recommendations made that could allow companies and other outside entities help with the connectivity and accessibility issues.

Within the realm of analyzing the data collected, other coding techniques besides holistic and in vivo coding could also be used in order to better understand the phenomenon such as concept and emotional coding. Various techniques would allow other researchers and readers to gain a better understanding of the impact of remote learning and develop more detailed recommendations for future events.

The research areas could also be expanded upon in future studies. In reference to academic achievement, a longitudinal study could be conducted in order to understand the long-term impact remote learning had on students. Since remote learning brought about a change in the reporting of academic achievement, it would be beneficial for

educators and administrators to understand the impact of pass/fail reporting of grades. It would also be recommended to investigate the impact of remote learning on GPAs for those students in high school. Since GPAs impact scholarships and college/university admittance, understanding its impact would also help administrators and teachers understand and better prepare for future remote learning settings. Likewise, it would also help administrators and teachers promote the skills the students need in order to be successful in the transition from high school.

### Summary

In all, the current study found that remote learning generally impacted the students in a small, private, Christian school in the Midwest negatively. The students' academic achievement was not easily assessed, analyzed, or reported, and skill and social development stood still or was completely missing. However, it is important to recognize that remote learning would not have been possible without the technology that is available today. Internet, devices, and applications have been developed that are more widely accessible to everyone, but that does not mean everyone has the means to possess them. Teachers were also able to learn more about the devices and applications available to them, and that allowed them to have new tools to assist in their classrooms as well as in future remote learning settings. While most of the feedback and perceptions of remote learning were negative, it is important to recognize there were positives and schools will now be more prepared for future similar situations. The school closures of the Coronavirus-19 pandemic took everyone by surprise, but the closures will help schools and educators to prepare for future events and take action within hours of an emergency.

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## Appendix A

### Interview Protocol and Questions for Faculty

Interviewee:

Interviewer:

Date:

Time:

Location:

Purpose of the Interview: The purpose of this research was to explore the perceptions of faculty in regard to the use of educational technology during the school shutdowns from March 2020 to June 2020, specifically in a small, private K-12 Christian school in the Midwest in order to increase the awareness of the changing needs of our students, educators, and families. At this stage in the research, the use of educational technology will be generally defined as the inclusion of technology to enhance or replace the traditional classroom setting. This study aims to answer the question: how did remote learning impact the students in a small, private Christian school in the Midwest during the Coronavirus-19 pandemic?

Confidentiality: To facilitate my note-taking, I would like to record the audio/video of our conversation today. Is that okay? Please sign the release form. For your information, my professor and I will be the only ones with access to the recording which will be deleted once it is transcribed. The transcript will also be destroyed after 30 days from the

completion of the class for which it has been created. This form states that all information will be held confidential, your participation is voluntary and you may stop at any time if you feel uncomfortable, and I do not intend to inflict any harm. Thank you for agreeing to participate.

Introduction: You have been selected to speak today because you have been identified as an individual who has a great deal to share about teaching and learning with the lens of educational technology within the remote learning time of the Coronavirus-19 pandemic. This research project as a whole focuses on the impact educational technology has on teaching and learning during remote learning, particularly the benefits and drawbacks of its implementation. This study does not aim to evaluate your own experiences or skills; rather I am trying to learn more about teaching and learning with the use of educational technology for remote learning. I hope to learn more about the specific drawbacks and benefits to help improve the educational settings of the future. I expect this interview to span about 30 minutes. Unless you have any questions, we will begin with some broad questions.

Background questions:

1. Can you describe your educational background?
2. Briefly describe your role(s) as it relates to the educational setting.

Probe A. How are you involved in teaching, learning, and implementing educational technology?

3. Describe your role in the educational setting during remote learning.



4. Describe the methods you used to teach during the remote learning time period.

5. Which of the previous mentioned devices do you view as being effective for the learning process during remote learning? Why?

Probe A: Ineffective

6. Which of the previous mentioned applications do you view as being effective for the learning process during remote learning? Why?

Probe A: Ineffective

7. Explain how prepared/comfortable you were in using these devices and applications during remote learning?

8. What were some of the highlights of teaching during remote learning?

9. What were some of the drawbacks of teaching during remote learning?

Focused Questions:

10. Describe your perspective of remote learning's impact on the students' academic achievement.

Probe: Grading

11. Describe your perspective of remote learning's impact on the students' skill development.

Probe: Time management, interdependence, 21<sup>st</sup> century skills

12. Describe your perspective of remote learning's impact on the students' social growth.

Probe: Connectedness, mental health, social interaction, support network

13. Do you have anything else you feel would be beneficial to share about educational technology during the remote learning?

Conclusion: Thank you for your detailed feedback regarding the use of educational technology during the Coronavirus-19 pandemic. I appreciate your time and again want to assure you that your responses will remain anonymous. Please reach out to me with questions or information that you would like to add to the discussion. I will reach out to you once the transcript is completed. Would you feel comfortable reviewing it? If I need any clarification or further information, I will contact you. Also, once the study is completed, I will reach out to you to share the final publication. Again, thank you for your time and input.