2021

Teacher perceptions of E-learning during Covid-19 in low-and-high-income schools

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TEACHER PERCEPTIONS OF E-LEARNING DURING COVID-19 IN LOW- AND HIGH-INCOME SCHOOLS

A dissertation submitted to
the Graduate College of
Marshall University
in partial fulfillment of
the requirements for the degree of
Doctor of Education
in
Curriculum and Instruction
by
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Marshall University
August 2021

APPROVAL OF DISSERTATION

We, the faculty supervising the work of Thomas Cooper, affirm that the dissertation *Teacher Perceptions of E-Learning during COVID-19 in Low- and High-Income Schools*, meets the high academic standards for original scholarship and creative work established by the Curriculum and Instruction program and the College of Education and Professional Development. This work also conforms to the editorial standards of our discipline and the Graduate College of Marshall University. With our signatures, we approve the manuscript for publication.

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ACKNOWLEDGMENTS

I would like to express my gratitude to all those who helped me during the dissertation process. Without them, this project would not have been completed. I'd like to thank my dissertation committee for working with me through difficult times and guiding me to create this study, especially my chair Dr. McFall. To Ms. Kennedy, a sincere thank you for supporting and believing in me from the moment I began working with her.

I'd like to thank my wife, Hannah, for pushing me to follow my goals and better myself as she always has. I'd like to thank my mom, Tamra, and dad, Thomas, for making education a priority for me as a child. I also would like to acknowledge the positive influence on my life that has been the Simile family.

Lastly, I want to dedicate this work to my son, Thomas Cooper III, born during the creation of this study.

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ABSTRACT

This study examined if there were significant differences among K-12 teachers at low-income and high-income schools on their perceptions of various aspects of e-learning due to COVID-19. The study also sought to collect data concerning how teachers' perceptions of technology may have changed, what factors impacted their ability to conduct e-learning, and what factors most impacted their students' performance during e-learning due to COVID-19. A concurrent nested mixed-methods design was used. A 15-item self-report survey containing both Likert scale and open-ended questions was developed by the researcher to assess differences in teachers' perceptions. Findings indicated a statistically significant difference in perceptions on the impact of a lack of a school-issued device on student performance. Emergent theme analysis revealed that teachers at low-income schools were more likely to have a positive change in their view of technology, attribute effective e-learning to professional development, become aware of the impact of socio-economic status on student performance, cite parental support as a factor in students who performed well during e-learning, and mention a lack of access to the internet as a factor in poor student performance. Conversely, teachers at high-income schools were more likely to have a negative change in their view of technology, attribute effective e-learning to their personal skill, change their classroom policies to accommodate students during e-learning, cite previous in-person performance as a factor in students who performed well during e-learning, and mention a lack of parental support as a factor in poor student performance.

CHAPTER 1: INTRODUCTION

This chapter will introduce and elaborate on the basis of the study. The study aims to discover if there are significant differences in perception among K-12 teachers at low-income and high-income schools on e-learning due to COVID-19. The study collected data concerning how teachers' perceptions of technology may have changed, what factors impacted their ability to conduct e-learning, and what factors most impacted their student's performance during e-learning due to COVID-19. The data was analyzed using a mixed-method approach to determine the significance of the difference in these aspects of e-learning between teachers at low-income and high-income schools. This chapter includes the background, problem statement, research questions, operational definitions, the significance of the study, and the organization of the study.

BACKGROUND

The importance of technology in the classroom was brought into sharp focus in March of 2020. The COVID-19 pandemic forced institutions across the nations to shut down face-to-face operations in order to limit the spread of the SARS-CoV 2 virus. This, in turn, caused the entire educational system of the United States to nearly instantaneously adapt its instructional methods to an emergency remote online approach. The majority of schools would operate entirely online for the rest of the 2020 school year, putting the effectiveness of their 1:1 device initiatives, technology training, and local infrastructure to the test (Hamilton et al., 2020). Emergency remote learning, also known as e-learning, put new strains on many demographics, mostly affecting low-income students (Garcia & Weiss, 2020; Reich, et al., 2020; Wyse et al., 2020). The realization of inequality forced a national conversation on the issue of internet access and the digital divide as well as what should be done about students who failed as a result of financial

hardship brought on by the mass quarantine or a lack of access to online school material (Hamilton et al., 2020).

Over the last decade, trends have suggested teachers are becoming increasingly likely to take advantage of technology in their classroom and encourage their students to interact with it meaningfully (Singleton et al., 2018). Yet, the rate of this increase is not consistent across all schools. Schools with substantial amounts of low-income students face barriers to the adoption of technology (Singleton et al., 2018). With the advent of widespread emergency remote learning due to COVID-19, schools were pushed into widespread and sudden adoption of technology that put teachers in a position to make meaningful changes in their perception of technology. On the other hand, e-learning has made teachers weary of the role of technology in education and therefore, reluctant to meet its challenges. Schools with lower technology adoption rates suffered more during e-learning and were less able to meet its challenges (Garcia & Weiss, 2020).

Evidence of a gap between low- and high-income students has existed as long as the idea of formalized education (Reardon, 2012). Before the idea of compulsory public education, schooling was a privilege for those who could afford it or were affiliated with a religious organization that would provide it (Thattai, 2017). Public education was a policy first designed to benefit the economically disadvantaged who were routinely without access to quality education. In the U.S. compulsory education for all Americans, regardless of income, was a way to prevent poverty, increase quality of life, and instill democratic values (Thattai, 2017). Modern schools provide a myriad of programs to improve the educational experiences for low-income families such as bussing, free and reduced lunch, and mandates that require schools to provide classroom materials. Yet, despite these interventions, the achievement gap persists. Moreover, new gaps have developed with the advent of the internet and the devices used to access it such as the

digital divide and homework gap (Gourneau et al., 2017). Technology has both opened the possibilities of education but also left many behind.

Research by Simoni et al (2016) has shown that socioeconomic status plays a role in a child's access and ownership of technology. Low-income students are less likely to have technology access. Low-income households have poor internet connections and speeds compared with those of higher incomes (Simoni et al., 2016). In line with that data, the Department of Housing and Urban Development reported in 2016 that connection rates and speed are even lower for those living in low-income homes or HUD rentals. Families using HUD are more likely to rely solely on smartphones for all technological needs putting them behind their higher-income peers in technology-related skills such as typing (Department of Housing and Urban Development, 2016). Low-income homes cite the price of internet and devices as the main barrier to internet access (Department of Housing and Urban Development, 2016). Students without internet access consistently score lower on achievement tests than their peers (Nation Center for Education Statistics, 2018b).

The phenomenon of decreased access and technological literacy for the impoverished is known as the digital divide. The digital divide has been shifting from issues caused by a lack of access to issues regarding the quality of access (Horrigan, 2017). As new technologies emerge, wealthier households are more likely to embrace those technologies and gain an edge over poorer household (Horrigan, 2017). The digital divide has been the main reason behind the rise of failing homework grades among poorer students known as the homework gap (Horrigan, 2015). The homework gap persists in schools that assign work that requires the internet at home. Low-income students are less likely to have a device at home or internet access, which forces them to travel to areas with free Wi-Fi or computers, adding difficulty to their assignments (Nation

Center for Education Statistics, 2018b). Technology access points take longer to travel to in rural communities, which widens the homework gap among the rural poor (Blanchard et al., 2016). Providing students with access to technology at school can somewhat mitigate the digital divide but if students do not have access at home, they will lag behind their peers in school performance, technology literacy, and achievement (National Center for Education Statistics, 2018b).

To conquer both the digital divide and the homework gap, school districts began securing funds for students to have a school-issued device that could be taken home each day (McAllister, 2018). Yet, even when schools with many low-income students reached the 1:1 technology ratio, issues still arose. When and where the student has access to Wi-Fi determines the likelihood that they will be able to comply with the demands of homework (Anderson & Perrin, 2018). Low-income students are more likely to receive discipline referrals than their wealthier peers and suspension can mean several days without access to Wi-Fi (Monson, 2014). According to a study by Harold (2019), low-income students are also most likely to damage, misplace, or improperly maintain their technology when assigned a personal device. While insurance is available, it requires an upfront cost and deductible, which many families cannot afford. This causes low-income students to go without once their device is inoperable putting them behind and, in some schools, subjecting them to discipline referrals for not being prepared for class (Harold, 2019).

A study by Blanchard et al. (2016) revealed that teachers within low-income schools are less likely to utilize technology. Low-income schools are defined as any school with 40% or more of its students eligible for the free or reduced lunch program (National Center for Education Statistics, 2018a). The study shows that high-poverty schools typically have limited resources such as lack of funding, high teacher turnover, and poor technology-based professional

development opportunities. Due to limited resources, high-poverty schools fall behind well-funded schools in technology use and skill mastery for students. The study also indicated that teachers who are new to the field, lack experience in managing technology for students and utilizing technology to enhance their practices. Under-experienced teachers who lack the ability to manage classrooms with many low-income students, tend to avoid the use of technology in their classroom to avoid potential distraction (Blanchard et al., 2016).

With the background provided, the study aims to discover the significance of the difference in perception among teachers at low-income and high-income schools concerning e-learning during the Spring of 2020 and Fall of 2021. The study will reveal and establish other teacher demographics that also have a significant difference of perception on their experience with e-learning. Lastly, this study identified and examined factors of e-learning that teachers believe to have had a significant impact on their success and the success of their students during e-learning. Based on the findings, the study will make recommendations and suggest adjustments that can be deployed by schools and policymakers to improve professional development training for teachers and shed light on remote learning barriers or benefits that teachers are seeing firsthand.

PROBLEM STATEMENT

The problem presented in this study is the absence of data sets that examine teachers' perceptions in predominantly low-income or high-income schools on what factors impacted their ability to conduct e-learning and their student's ability to succeed. There is also a lack of data concerning how teachers perceived the impact of e-learning on their use of technology and their classroom policies. Research surrounding COVID-19's impact on education is in its infancy. A year after the pandemic shut down schools across the nation, many districts remained in a state

of emergency remote learning or were allowing their student population to choose to remain home until vaccines were more widely available and proven effective (WVDE, 2021). Some early studies have focused on the pandemic's impact on academic performance and the implication of the data gap it created as standardized testing requirements were made. In West Virginia, some students returned to face-to-face instruction as early as September 8, 2020. Despite this, schools were forced back into emergency remote learning several times before ultimately remaining open for students who selected face-face instruction in February 2021 (Dameron, 2021). With teachers and students back to face-to-face instruction, there is an opportunity to address a new set of research issues. Based on Fowler's (2014) work, it is imperative to have a data set on the opinion of grassroots implementers to inform decisions on programs. This study will inform policymakers when considering future uses of emergency remote learning and help determine if resources should be distributed differently to facilitate emergency remote learning should issues similar to COVID arise.

RESEARCH QUESTIONS

The following research questions were investigated:

1. What differences, if any, are there in how teachers' perceptions of technology in the classroom changed as a result of eLearning due to COVID-19 in low-income vs. high-income schools?
2. What differences, if any, are there in the factors teachers identify as contributing or hindering their ability to effectively conduct e-learning due to COVID-19 in low-income vs. high-income schools?
3. What differences, if any, are there in teachers' experiences with eLearning due to COVID-19 in low-income vs. high-income schools?

4. What differences, if any, are there in teachers' perceptions of how eLearning due to COVID-19 impacted their students in low-income vs high-income schools?

OPERATIONAL DEFINITIONS

Changes in classroom expectations – an individual teacher's perception of how their classroom expectations changed during e-learning due to the COVID-19 pandemic as self-reported on the survey instrument.

E-learning due to COVID-19 – This refers to the suspension of all in-person learning in West Virginia from March to May 2020 due to the COVID-19 pandemic and subsequent transition to an all-online content and instruction delivery system.

E-learning's impact on opinions of technology's role in education – Change in a teacher's feelings towards technology as a result of e-learning due to Covid-19 as self-reported on the survey instrument.

Face-to-Face Instruction – A traditional educational setting where content and instructions are delivered to students who are physically in the classroom.

Factors that contributed to good student performance during e-learning – an individual teacher's perception of factors or circumstances that can be attributed to students who performed well during e-learning due to the COVID-19 pandemic as self-reported on the survey instrument.

Factors that contributed to poor student performance during e-learning – an individual teacher's perception of factors or circumstances that can be attributed to students who performed poorly during e-learning due to the COVID-19 pandemic as self-reported on the survey instrument.

Factors that contributed to effective e-learning – an individual teacher's perception of factors they believe contributed to their ability to effectively conduct e-learning during the COVID-19 pandemic as self-reported on the survey instrument.

Factors that hindered effective e-learning – an individual teacher's perception of factors they believe hindered their ability to effectively conduct e-learning during the COVID-19 pandemic as self-reported on the survey instrument.

High-Income School – A school that does not qualify for Federal Title 1 assistance or has a free/reduced lunch rate below 40%.

Institution Level – The type of school a teacher is primarily working in. This is limited to elementary, middle, high, and CTE schools on the survey.

Low-Income School – A school that qualifies for Federal Title 1 assistance or has a free/reduced lunch rate above 40%.

Primary Teaching Subject – The curriculum the teacher is responsible for administering. This can include multiple subjects.

Technology Driven Strategies – Instructional methods that utilize electronic devices or applications as the main medium by which to enhance the lesson.

Total years of teaching experience – Years of teaching experience consisting of the total number of years as a teacher in K–12 educational levels.

SIGNIFICANCE OF THE STUDY

In the Spring of 2020, the effects of COVID-19 caused the entire state of West Virginia to shut down face-to-face instruction in favor of an impromptu, all online curriculum (W.V. Department of Education, 2020). Quickly, the West Virginia Department of Education realized a significant portion of its students did not have access to either the internet or device and suspended grading for the remainder of the school year (W.V. Department of Education, 2020). It has become necessary that assessments and inquiries be made into teachers' perceptions of the impact of e-learning, views on technology, their classroom expectations, and the students they were assigned to teach. While the American education gaps fail to close in achievement and access to technology, it is important to evaluate how those realities affect schools (Porter, 2015). This is especially true in crisis situations, like a global pandemic, where new effects of these gaps might be witnessed, and new consequences observed. It is imperative that the pandemic is researched in a timely manner to determine if school resources are being used effectively and provide data to guide schools in future scenarios that call for emergency remote learning. School districts across the nation have committed funds, time, and energy into programs to negate the digital divide, allowing students to interact with technology in a meaningful way both in and out of school regardless of their income. Communicating with grassroots implementers will allow us to determine if those programs and other policies helped teachers and students navigate e-learning.

This study is significant because it will inform policymakers of the viewpoints and concerns of their grassroots implementers. E-learning is bound to have consequences on not only students but teachers and their practices as well. This study will provide new data on those concerns. It will also aid in decisions about where to target professional development programs

concerning technology if significant differences are seen between demographics. Data from this study may also be useful for county and state policymakers as they determine future uses of e-learning and funding for policies to diminish its negative impacts and support its positive ones.

This study can also determine the perception of teachers towards low-performing students and students in predominately low-income areas. Data from the study can be used to decide if more professional development should be introduced to address the reality of poverty in the American classroom and realities like the digital divide. The study may be used to understand trends in lapses of technology use, helping the district better understand and design implementation strategies to better benefit low-income students. Lastly, the study can help illuminate the strengths and shortcomings, as witnessed by teachers, of students when forced into emergency remote learning.

ORGANIZATION OF THE STUDY

The study is organized into five chapters. Chapter One of this study includes an introduction, background, statement of the problem, research questions, significance of the study, operational definitions, and a description of the organization of the study. Chapter Two presents a review of the literature surrounding the study. Chapter Three highlights the methods and procedures used to collect the data for the study as well as its limitations. Chapter Four presents the findings of the study. Lastly, Chapter Five shows a summation of the findings, a discussion of implications, conclusions, and recommendations for future research.

CHAPTER 2: REVIEW OF THE LITERATURE

INTRODUCTION

This chapter will review the relevant literature. The literature review contains four sections. The first section discusses the status and effect of child poverty and a student's income in American education. The second section outlines a brief history of technology and the internet in education and how it relates to aiding low-income students. The third section addresses teacher perceptions of technology and technology-driven strategies in the classroom. It also features research around their efficacy. Lastly, the fourth section of the literature review discusses the COVID-19 pandemic and what newly emerging research has identified as its impact on education in America. This literature review was conducted using keyword searches related to the study at the Marshall University library website, http://www.marshall.edu/library, and entries in peer-reviewed journal articles.

EFFECT OF INCOME IN AMERICAN EDUCATION

The U.S. Census Bureau (2020) defines poverty as households below the Federal Poverty Threshold (FPT). The bureau's threshold for poverty varies based on family size, requiring more income the larger the family though it is estimated that an income of 200% of the FPT is needed to provide all the basic family needs (U.S. Census Bureau, 2020). For example, while the FPT for a family of two with one child is $16,543, that family would need $33,086 to live comfortably regardless of what state the family resides in. Families below 200% of the FPT are listed as low-income (USCB, 2020). The Council on Community Pediatrics (2016), compiled a report on child poverty in the U.S. They found that 41% of children are considered low income. Children are also overrepresented in poverty statistics (Council on Community Pediatrics, 2016). Their report revealed that while children only make up about 23% of the nation's population,

they make up 32% of its impoverished. Within the 41%, 19% are below the FPT in a category known as "deep poverty" (Koball & Jang, 2018). This means roughly 1 in 5 children do not live in households that can provide basic needs. On the whole, poverty among children in America is declining, dropping from a high of 46% in 2012 to 41% but America still has among the highest child poverty per capita among peer countries (Council on Community Pediatrics, 2016).

Poverty does not affect each race and/or ethnicity equally according to a report compiled by the National Center for Children in Poverty (2019). The NCCP reported that 28% of white children are classified as low-income, with 5% in deep poverty. Children of Asian ethnicity have similar statistics to white children with 28% low-income, and 5% in deep poverty. In contrast, 61% of black children are considered low income, with 17% in deep poverty. Native Americans have the largest percentage of children in deep poverty at 18% (NCCP, 2019). Lastly, 40 % of children who are multiracial or come from an extremely small racial demographic within the U.S. are considered low-income (Koball & Jiang, 2018). While other races are impoverished more per capita, there are more Hispanic children in both low-income and deep poverty than any other ethnicity. Fifty-nine percent of Hispanic families are living at the low-income level, with 11% in deep poverty (Koball & Jiang, 2018).

According to the Bureau of Economic Analysis with the U.S. Department of Commerce (2019), West Virginia is one of the most impoverished states in the U.S. When ranked states by per capita income, West Virginia ranks 49th, only in front of Mississippi. Higher educational attainment is linked with higher lifetime earnings (Social Security Administration, 2015). Yet, West Virginia ranks 50th in educational attainment with less than 1/5th of its population earning a bachelor's degree or higher (U.S. Census, 2018). Poverty affects minorities to a greater degree in the state. The poverty rate among African Americans is over 30% while the rate for whites is

18%. Both Latino and Asian Americans have poverty rates of over 20% (Center for American Progress, 2020). This poverty transfers to the children in the state. In West Virginia, 48% of its children are considered low-income, 5% higher than the national average of 43%. Nearly 1/4th of children in West Virginia are living in poverty (O'Leary, 2019). The county that is the focus of the study nearly mirrors the national statistics. Approximately, 22% of families within the district are impoverished and 43% of the student body is eligible for the free and reduced lunch program, which is available for families that make less than 185% of the FPT (National Center for Education Statistics, 2018c).

Poverty affects students' health, which lowers performance levels. Undernourishment, obesity, and stress-related disorders are commonplace among the poorest of America, all of which adversely affect school performance (Council on Community Pediatrics, 2016). Poverty can result in a lack of educational stimuli and opportunity, which affects the brain development and the overall cognitive ability of young children. Children at 150% of the FPT are approximately 3% to 4% behind development norms, while children at 100% of the FPT or below are 8% to 9% behind development norms. These structural differences account for a considerable portion of the achievement gap (Blair & Raver, 2016).

Poverty can also be correlated with trauma in children (American Psychological Association, 2020). Children in poverty are more likely to have a higher score on the Adverse Childhood Experience (ACE) survey. According to the American Psychiatric Association, trauma is defined as "actual or threatened death, serious injury, or sexual violence that is either directly experienced or witnessed" (American Psychiatric Association, 2017, p.271). Learning that any traumatic experiences have happened to a loved one or having repeated exposure to details of traumatic events can cause vicarious trauma (Maynard et al., 2019). Trauma-impacted

children are more likely to have cognitive impairments that hurt school performance including low IQ, poor memory, diminished attention span, and developmentally delayed communication skills. Lastly, children who experience trauma are more likely to have negative school□related behaviors such as receiving discipline referrals, dropping out, and truancy (Maynard et al, 2019).

Poverty diminishes the possibility of educational enrichment outside of school, including a restricted ability to participate in after-school activities, access to literature and technology, as well as other resources paramount to educational performance (Olszewski-Kubilius & Corwith, 2018). Schools that are located in high-poverty areas are typically less equipped and frequently have high teacher turnover, fewer resources, under-experienced teachers, and fewer advanced classes (Gagnon & Mattingly, 2016; Garcia & Weiss, 2019). Children from impoverished households are also less likely to be exposed to positive adult peer mentors and adult role models to help them identify a path to success leading to an increased dropout rate for impoverished students (Olszewski-Kubilius & Corwith, 2018).

The achievement gap between affluent students and low-income students is evident and persistent throughout the entire K-12 experience. The achievement gap has been continually widening since the 1940s, and in 2017 it was the largest it had ever been (Porter, 2015). The achievement gap can be described as a 4-6-year difference in high school learning, meaning it would take that long for a poorer student to catch up to their more affluent peers (Reardon, 2012). Increased income inequality is the force researchers believe is driving the expansion of the achievement gap (Porter, 2015). The bottom 20% of students in household income have a dropout rate that is five times that of the top 20% (Rumberg, 2013). Factors like quality of courses, experience levels of teachers, class sizes, teacher turn-over, amount of technology present in schools, excessive television viewing, and summer learning loss have all remained

nearly at the same levels while income inequality has grown steadily for the last 50 years (Porter, 2015). This means that the amount of money families have to invest in their children, as well as the educational opportunities their income provides, greatly increases school performance (Porter, 2015).

Teacher perceptions of poverty have an impact on student academic success. While teachers often point to parents as the main determinate of success, they often undervalue their individual impact despite evidence to the contrary (Rand, 2020). Teachers typically see more affluent students as leaders, passionate learners, prepared, and well-mannered rarely describing low-income students in the same way. Instead, teachers are more likely to describe low-income students as needing discipline, aloof, and lacking parental support. These negative perceptions have been known to perpetuate inequalities in the classroom for over a decade (Ladson-Billings, 2006; Marx, 2006). Furthermore, a study by Norman (2016), found that teachers are likely to believe that behavior is more connected to culture, gender, or a child's role models than factors like poverty or the traumas that are typically associated with it. Teachers in the study had embraced a corollary to "color-blindness" termed "SES-blindness" by the researcher (Norman, 2016). SES-blindness was characterized as a belief that socioeconomic status was irrelevant in the classroom because the educational opportunity is equal. That by treating all children the same, regardless of SES, it was fair to both affluent and low-income children (Norman, 2016). This approach has been shown by the data from the study to further disadvantage low-income students, ignore educational policies, and in some cases, violate educational policies in regard to Individual Education Plans. Norman also found that these perceptions of low-income students often mirror and overlap with perceptions of minority students, especially black males, in American classrooms (Norman, 2016).

Teachers have the largest impact on the success of technology as a tool to reduce the achievement gap in high-poverty schools (Robinson, 2016). In high poverty areas, many students get their only interaction with technology outside of smartphones at school (Department of Housing and Urban Development, 2016). The way teachers direct this interaction is imperative to the growth of students (Alliance for Excellent Education, 2014). A teacher's experience, age, level of education, field, and perceptions of technology all impact the level at which they will implement it in their classroom (Li et al., 2019). The way in which the teacher implements the technology also makes a difference in student growth (Blanchard et al., 2016).

Researchers at the U.S. Department of Education (2017) believe that to some degree, the digital divide has been eliminated thanks in part to technology integration programs across the country (U.S. Department of Education, 2017). In their 2017 strategic plan, the Department of Education highlighted the genesis of a new type of digital divide that was based on technological use, not access. Low-income students are more inclined to only use technology passively, using it as a replacement for things like the digestion of reading material and pen and paper. Other, more affluent, students often interact with technology in a more transformative way, using their devices to collaborate, connect, code, consult, and create (Darling-Hammond, 2014; Zielezinski, & Goldman, 2014).

TECHNOLOGY AND ONLINE LEARNING

Learning remotely through the medium of technology is not inherently new. According to Ferrer (2019), as early as 1840, tutors were using the U.S. postal service in major cities to correspond with students, grading assignments and feedback through conventional mail. This method of remote learning evolved with the available technology. There is evidence of teaching via the telephone shortly after its widespread adoption in the U.S. To a lesser degree, radio was

also used to provide lessons to students though this system of learning was often one-sided. Instances of remote learning saw a dramatic increase with television and home video (Ferrer, 2019). Students could watch pre-recorded lessons, receive instruction, and watch real-time demonstrations all without being present in a traditional classroom setting (Siemens et al., 2016). The invention of the personal computer only enhanced remote learning by allowing students all the benefits of televised lessons while providing a medium to interact with and manipulate the material. Shortly afterward, the internet would transform remote learning to the point where online learning and remote learning are almost synonymous terms (Siemens et al., 2016).

A necessary prerequisite to online remote learning is the rise of the internet in education. According to Marwell (2019), the internet continues to become the most important source of information, socialization, and communication. It is so central to educational instruction that in 2019, it was reported that 99% of schools within the U.S. were not only connected to the internet but had high-speed, fiber-optic connections (Marwell, 2019). Though computer technology in schools predates the internet, it is clear that the internet, and its potential as an instructional venue and tool, was the driving force in the rapid growth of technology in the classroom and e-learning (Purdue Education, 2020). Teachers of younger children in public schools have historically found the internet to be a place primarily for socialization and included its use as a tool to reach students in a place that was already intrinsic to their everyday life. Interestingly, the internet is often seen as a place with too many distractions or unreliable sources to be a useful educational platform for k-12 learners. Adult learners were trusted with the additional freedom and lack of guidance that online education provides (Pratt, 2017). As early as 1996, there were fully accredited online universities. In a short time, adult learners, who tend to be more disciplined and self-motivated, have dramatically increased the use of online learning (Pratt,

2017). Over 90% of public U.S. businesses train and conduct professional development through e-learning. In 2018, 98% of U.S. colleges and universities offered at least one online course (Panigrahi et al., 2018). Many colleges offer Massive Open Online Courses (MOOCs) that provide asynchronous learning opportunities for free to the public (Siemens et al., 2016). In 2019, the University of Pennsylvania became the first member of the Ivy League to have a fully online bachelor's degree (Ferrer, 2019). Education via the internet eventually made its way into K-12 education. By 2012, many states including Florida, Michigan, and Virginia had passed legislation requiring public school students to complete one online course before they graduate (Sheehy, 2012). Almost all high schools utilize e-learning for their credit recovery program (Rizvi et al., 2019). In 2015, virtual public schools had enrolled up to six million students across all grade levels. Yet, statistics show that not only do these programs tend to underperform, they also disproportionally enroll more affluent white children than traditional schools (Molnar et al., 2019).

Technology, in the form of both devices and the internet, has made a massive impact on not only the field of education but society as a whole. Children who were born at and after the turn of the millennium have been immersed in and shaped by their relationship with technology their entire lives. As early as 2001, Marc Prensky noted the difference between these "Digital Natives," those who were born in technology, and "Digital Immigrants," those born before the boom in technology. As Howlett and Waemusa (2018), further described, digital natives tend to have positive outlooks on technology and quickly adapt to technological changes. Digital natives are also more likely to rely on newer technology for entertainment and information like smartphones and spend less time listening to the radio or watching television for example (Howlett & Waemusa, 2018). Computer technology is one of the fastest-growing segments of the

modern economy and few jobs that digital natives will seek have not modernized around computers in some fashion (Laboissiere & Mourshed, 2017). Even jobs that were once considered to have no interaction with computers, such as manufacturers, are facing a shortage of qualified workers who possess the necessary technological literacy (Kurshan, 2017).

To accommodate this new generation of students and grapple with technology's commonplace in business and day-to-day life, schools both utilize and teach digital literacy, the ability to successfully navigate technology. Schools have attempted to modernize traditional practices by adopting technology-centered standards and increasing access for students (Alismail & McGuire, 2015). Technology, when utilized properly, has been shown to reduce the achievement gap and boost engagement in class among low-income students (Alliance for Excellent Education, 2014). To achieve growth in both digital literacy and retention of low-income students, the following guidelines are recommended: one-to-one computer access, speedy and reliable internet connections, software and apps designed to promote high levels of interactivity and engagement, technology as a medium for creation as well as reading material, blended learning environments, characterized by significant levels of teacher support, and opportunities for interactions among students as companions to technology use (Alliance for Excellent Education, 2014).

E-learning typically relies on virtual instructional strategies like Zoom, WebQuest, Nearpod, and Flipped Classroom as well as learning management systems like Schoology in order to utilize the technology and ingrain 21st-century skills in their students (Williams-Britton, 2020). E-learning can also utilize traditional instructional methods as well such as text, multimedia platforms, lectures, quizzes, and discussion (Panigrahi et al., 2018). E-learning is able to accomplish two goals for many educational communities. Firstly, e-learning increases the

reach of the school, allowing students from other areas to participate in learning. Secondly, e-learning can be a cost-saving venture, decreasing overhead by removing the need for a physical building and associated maintenance staff (Moore et al., 2011).

E-learning can be implemented in several different models: synchronous, asynchronous, and blended. Synchronous e-learning functions like a traditional face-to-face class in that all students are expected to engage with the material at a certain time and with live guidance by the instructor. This is typically accomplished via apps that utilize webcams and microphones so that students and teachers can interact without being in the same classroom (Siemens et al., 2016). Concepts like attendance and tardiness still have meaning in the synchronous model of teaching remotely. According to Rizvi et al. (2019), asynchronous is a more self-directed approach and requires more student discipline. Asynchronous does not require live, full class, meetings. Instead, course material is offered to the student, and they may engage with it whenever they are able (Rizvi et al., 2019). The study showed asynchronous to be an effective model for those students with more responsibilities who may not be able to commit to a highly structured model. In this model, traditional classroom concepts like attendance, do not apply. Instead, teachers can monitor login time and submission rates to determine participation (Rizvi et al., 2019). Lastly, a blended approach utilizes a traditional classroom for some class meetings while simultaneously maintaining a synchronous/asynchronous remote e-learning course. This is typically utilized to reduce the number of face-to-face meetings whether because of the distance the learners travel or environmental factors like weather or pandemics (Zheng et al., 2020).

Research reporting the effectiveness of remote learning is mixed (Rizvi et al., 2019). Some studies have suggested that there is no statistically significant difference in student outcomes between face-to-face and remote e-learning. Other studies contended that while e-

learning may be an option for some students, it is not a substitute for in-person instruction (Rizvi, et al., 2019). Government entities also have criticized the effectiveness of e-learning. For example, in January 2021, school districts in West Virginia required all students to return to in-person learning during the COVID-19 pandemic and completely removed its policy of closing schools due to high transmission rates in the community (Dameron, 2021). In addition to data suggesting slower transmission rates and increased availability of vaccines, another reason cited for the decision to return those students by the West Virginia Department of education was poor student performance and outcomes due to e-learning (West Virginia Department of Education, 2021). Despite the mixed data, e-learning, studies do indicate factors that have positive outcomes for students. There is a positive correlation between the time a student is logged in and their grade (Panigrahi et al., 2018). The rate of interpersonal responses between students and instructors also has a significant positive impact on student performance. Lack of interaction with an instructor is a strong predictor of poor student performance in online courses. Due to the significance of interaction, blended course models tend to have higher success rates when compared to synchronous and asynchronous online courses (Panigrahi et al., 2018). Online courses commonly suffer from poor retention rates. Students who are attracted to online learning because of the reduction of social interaction and avoid it in the course may fail to thrive in an online environment (Rizvi et al., 2018).

Historically, the largest transition to online learning occurred during the 2020 COVID-19 pandemic crisis (Hamilton et al., 2020). The internet rapidly encompassed the delivery of all educational instruction in most school districts across the U.S. Schools were forced to make a sudden change from in-person instruction to fully online delivery (Hamilton et al., 2020). This shifted the burden of access from school districts to students. Students would need to have both

access to the internet and a device in their homes to receive their mandated, state education. Districts rushed to increase their 1:1 programs and provide wireless hotspots in high-need areas. Despite these programs, early reports showed that those without reliable access to the internet, devices, or parents/guardians able to monitor their schooling fell dramatically behind their peers (Hamilton et al., 2020). In West Virginia, the Department of Education was forced to institute a grading freeze to avoid failing thousands of students for lack of access (W.V. Department of Education, 2020).

TEACHER PERCEPTIONS OF TECHNOLOGY

When technology is properly utilized, it can easily provide a launching point for learning that promotes active student engagement, beneficial student partnership, and peer interaction. The task of utilizing technology in a manner that benefits students falls squarely on the shoulders of teachers (Sawyer, 2017). In the 2017 National Education Technology Plan, teachers were called to ensure the technology's benefit to students by taking the necessary steps to incorporate it effectively into their lessons (Office of Educational Technology, 2017). Other entities have also commented on the large influence teachers have on technology implementation. The U.S. Department of Education (2017) expressed its concern that professional development support for teachers involving technology will not make a discernible impact on learning. In 2016, a study by van Broekhuizen reported that how technology is used in the classroom is crucial. Exposure to high-level functions of technology is recommended not only for higher student achievement but to also build skills for job opportunities in the future. Many educators see value in basic applications, like email, browsers, and word processors. These tools are commonplace and have little issue finding a use in classrooms (van Broekhuizen, 2016). Yet, the same study found that educators often struggle to assign a similar value to more complex tools like photo/video editing

software, illustrating apps, website creation, and animation. These complex tools encourage more critical and creative thinking and usually call for skills like collaboration and teamwork (van Broekhuizen, 2016). It is precisely these types of technology skills that are believed to help close the new digital divide and with it, the achievement gap (Darling-Hammond et al., 2014; U.S. Department of Education, 2017).

An educator's personal beliefs about the technology and the strategies needed to effectively employ them are difficult to change. Because they are personal perceptions, educators may not be able to realize that their own thoughts about technology are what is keeping them from using it better (Sawyer, 2017). While administrators try to encourage more beneficial and productive use of technology in their classrooms, they must pay heed to the impact of these educator's personal perceptions and the barriers negative ones can create for overall technology integration (Zur & Zur 2016). Studies that assessed teacher perceptions of technology discovered that while teachers believe students should have access to a device and that 21st-century skills are necessary for success, they also ranked statements like "Technology should be used in all courses" and "students should use technology more in class" lower on survey instruments (Heath, 2017). These opinions conflict with the recommendation from the National Technology Education Plan (2017), which suggested a greater degree of technology usage daily in each class. Data from the same study showed that there is a positive relationship between an educator's perceptions of technology and the level of technology integration in their classroom strategies. An educator's perception, therefore, has the capability of predicting his or her degree of technology integration. In the same vein, an educator's level of education seems to positively impact both his or her perception of technology and the overall quality of his or her technological practices (Heath, 2017; Sawyer, 2017).

Teachers, before the COVID-19 pandemic generally had positive outlooks and opinions on e-learning. One study found 65% of teachers surveyed believed e-learning did not negatively impact student motivation when compared to their experiences in face-to-face classrooms (Zheng et al., 2020). Nearly all teachers noted the usefulness of e-learning and a majority found it to have greater potential in the future but in that same study, 55% of teachers complained about the lack of intuitiveness in maintaining an e-learning classroom (Zheng et al., 2020). Teachers noted that there was a need for more targeted professional development concerning e-learning. Yet, the majority of teachers misidentified where their professional development lapses existed. For example, teachers claimed to need professional development that provided e-learning strategies, but performance data suggested that the strategies being used were appropriate (Zheng et al., 2020). In actuality, the shortcomings in student performance were most likely related to poor course design. Teachers tend to amend their strategies for e-learning but often fail to operate and design the class in a way fundamentally different from face-to-face. Poor course design for an e-learning class has been attributed to poor student performance and more clerical work for teachers (Zheng et al., 2020).

Teachers with experience in e-learning believed communication to be a more important factor in e-learning than in face-to-face (Yanti et al., 2018). Providing personalized encouragement, engagement, and motivation is necessary for the success of an e-learning course and effective communication and facilitation are the only means of providing it in an online, individual setting. Teachers also found that e-learning changed their perception of their role in education. A majority of teachers categorized themselves as “knowledge guides” as opposed to “knowledge givers” (Yanti et al., 2018). In another example, teachers found that best practices involving classroom management and discipline seemed to have no use in an online setting.

Discipline referrals that addressed issues outside of academic dishonesty were exceedingly rare (Zheng et al., 2020). With these issues minimized, if not totally erased, teachers felt online classes were much more focused on pedagogy than traditional classes. This in turn causes online classes to typically outpace face-to-face (Lin et al., 2015).

Teachers saw themselves as spending more time preparing lessons and less time delivering content. Teachers also tended to believe that online learning was demanding a longer workday though some studies show no major difference (Kaden, 2020). Teachers felt that the lack of face-to-face visual cues leads to less skill repetition and learning checks. In a traditional class, teachers get instant feedback through student body language and responses to questions that they can use to determine skill mastery (Lin et al., 2015). The disconnect e-learning creates from these cues causes online classes to proceed to new material faster and increase the amount of time between a student's attempt on an assignment and feedback. Students who struggle with a concept in an e-learning class typically have to wait longer for intervention from their instructor (Lin et al., 2015).

COVID-19 IMPACT ON EDUCATION

As chronicled in the American Journal of Managed Care (2021), in March of 2020, the COVID-19 virus was named a pandemic by the World Health Organization and the first cases of the virus were reported in the United States. This was quickly followed by a national state of emergency that shut down all non-essential businesses and institutions, limited travel, and led to a slew of "stay-at-home" orders from state governments. Universities were among the first institutions to be shut down as they were deemed a high-risk breeding ground for the virus. Soon the majority of schools in the nation began to close their doors (American Journal of Managed Care, 2021). West Virginia, at first, simply closed schools for a week as authorities learned about

the spread of the virus and its effects. These closings were extended several times before it became clear that an emergency remote approach was necessary to continue education for hundreds of thousands of children across the state. Schools in West Virginia remained closed to face-to-face instruction for the rest of the 2020 school year (Damron, 2020). The reopening of schools for the new school year was delayed until after Labor Day. Students in the county that participated in this dissertation study were given the choice to return to face-to-face instruction under strict safety guidelines, remain at home and be taught through emergency remote learning, or enter into the county's virtual program. Like many schools across the nation, face-to-face learning has fluctuated and was intermittently canceled as a result of rising cases in the county and orders from the governor (WVDE, 2020).

There is a unique and profound difference between traditional online learning and what has been termed "emergency remote learning" or e-learning. (Hodge et al., 2020). Online learning is typically performed by well-organized institutions with trained professionals that specialize in the use of technology and the internet to make learning in that venue effective. Emergency remote learning has proven to be a drastically different approach than online learning (Hodges, et al., 2020). Pre-pandemic research shows that learning at home is typically only effective when the student has intentionally personalized, consistent support and resources. Many students who were forced to participate in emergency remote learning due to COVID-19 lacked these attributes, especially students from low-income households (Garcia & Weiss, 2020). The lack of choice, preparation, and absence of direct teacher supervision in emergency remote learning caused by COVID-19 has led to reduced motivation among students and to a greater extent, low-income students. While online learning would not have been an option if a pandemic of this scale had occurred 30 years ago, there is no consensus that emergency remote learning

should be treated as a true and equal academic substitute for traditional learning and assessment of student knowledge (Wyse et al., 2020).

The sudden move to emergency remote learning created a huge knowledge gap for teachers (Middleton, 2020). Teachers overwhelmingly cited a lack of professional development, prep time, and guidance as obstacles to teaching effectively during e-learning. A lack of training and standardized procedure led to wide variations of teaching practices at the state, district, and classroom levels (Middleton, 2020). The average time students engaged with material dramatically dropped during the pandemic. Millions of students across the nation failed to log in at all during e-learning and failure rates dramatically increased. E-learning has blurred the lines of concepts like "absent", "truant", "late work", "homeschooled" and even the role of accountability and disciplinary action in a school setting (Garcia & Weiss, 2020). This academic loss, akin to summer academic loss, is predicted to have a rippling effect among learners for years to come (Middleton, 2020).

One of the earliest studies on teacher's perception of online learning came from China by Yang (2020) and was published just five days before the World Health Organization declared COVID-19 to be a global pandemic. By mid-February 2020, China emphasized a standard of high-quality as it ordered its public-school systems to switch to an all-online instructional delivery system (Yang, 2020). Fifty-two percent supported the move to e-learning and most teachers had already had some experience delivering content online. However, only half of the surveyed teachers reported receiving specific training for e-learning, and when it was available it was often characterized as too short. Teachers overwhelming found e-learning to be difficult with over 90% finding it at least more difficult than first imagined (Yang, 2020). The two most commonly reported issues were poor self-discipline from students and technical issues, mirroring

concern in the U.S. (Kaden, 2020). There were positive takeaways from e-learning in the world's largest school system, China. Teachers reported an increase in technological expertise, growth in personal relationships with students, and saw students become more independent learners (Yang, 2020). Teachers maintained that daily communication with each student individually was a key factor in students who found success during e-learning. Most teachers showed a willingness to normalize e-learning in the future but were still wary of its implication on the profession as a whole (Kaden, 2020; Kim & Asbury, 2020; Yang, 2020).

Another early study focused on the perception of elementary teachers and the challenges of transitioning younger students to an e-learning model. Teachers again reported that the uncertainty and lack of focused training were responsible for most of their stress (Song et al., 2020). Teachers also seemed to feel personally responsible for making e-learning work since they benefitted from being allowed to work from home during quarantine. Elementary teachers also worried about the social loss young children would experience with large stints of isolation and the lack of support they could offer students (Song et al., 2020). Many teachers specifically reported their perception of school food programs failing to adequately provide for students during lockdowns (Song et al., 2020). Teachers also believed the closing of schools broke down traditional relationships between teachers, students, and peers (Kim & Asbury, 2020). It also contributed to confusion about the role of the teachers in the future. Teacher's expressed concerns that if e-learning were to become the norm, demand for teachers may dramatically decrease. Teachers whose schools had 1:1 device programs reported higher rates of success with e-learning, though those same schools still reported issues (Kim & Asbury, 2020). Globally, e-learning due to COVID-19 impacted rural students to a greater degree, especially when access was an issue (Kaden, 2020).

COVID-19 and the quarantine that has accompanied it has had a negative effect on low-income students and their families. The poverty rate in America increased to 17% (Boghani, 2020). At its peak, unemployment raised to 15%, a rate that had not been recorded in the U.S. since the Great Depression (Congressional Research Service, 2020). Service and hospitality industries, which many low-income families work in, experienced the largest economic setbacks and laid off large percentages of their workforce. Workers without a college degree and part-time employees, attributes that define many low-income households, experienced the greatest amount of job loss and layoffs (Congressional Research Service, 2020). Racial minorities were more impacted by the recession, losing jobs, and entered poverty at a greater rate (Boghani, 2020). The closing of schools had an economic impact, many low-income families with school-aged children were newly burdened with a need for childcare to stay employed (U.S. Chamber of Commerce, 2020). Even when able to afford childcare, daycares themselves were not immune to the spread of the virus and routinely shuttered as schools did. It is estimated that 50% of working parents did not return to work when eligible because of childcare concerns, being unable to rely on the school system (U.S. Chamber of Commerce, 2020).

E-learning due to Covid-19 has had a disproportionate effect on low-income students. The achievement gap between rich and poor students has grown during the pandemic and is predicted to continue that growth (Garcia & Weiss, 2020). Many low-income students are relying on smartphones and internet access outside of their homes to complete their assignments. Schools with a high number of low-income students are less prepared and less engaged with students online. Physical separation from a teacher has had negative outcomes for low-income students (Wyse et al., 2020). Low-income students that perform poorly in face-to-face settings have been shown to perform worse in an online setting (Loeb, 2020). Students are removed from

important health monitoring functions teachers provide. For example, the majority of calls to Child Protective Services are made by teachers who witness evidence of abuse in their classrooms (Wyse et al., 2020). Teachers have reported that they have witnessed an intensifying of inequalities between affluent and low-income students as a result of remote emergency learning and its reliance on paid access to the internet and devices (Reich et al., 2020). Even if students have access, they may not have enough time to engage in E-learning due to sharing technology in their households with other school-aged children or parents working from home (Correia, 2020). Students can potentially be responsible for housework, babysitting, or even finding their own employment to offset the negative impact of the pandemic on their family's income (McCormick, 2020). There is a lack of research dedicated to the effectiveness of the 1:1 device initiative in addressing these issues during the pandemic.

CHAPTER 3: METHODS

INTRODUCTION

Chapter Three serves to outline the methods that will be used in securing and interpreting the data found in this study. This chapter contains the following sections: research design, population and sample, instrument development and validation, data collection, data analysis, and limitations.

RESEARCH DESIGN

This study was conducted using a concurrent nested mixed-methods design, that includes supporting qualitative data collected through open-ended questions using a multi-item survey for teachers. A mixed-method approach combines qualitative and quantitative research into one study, providing deeper insight, than if the data sets were used alone (Creswell & Creswell, 2018). Qualitative and quantitative methods can be combined into a study in several different ways. Firstly, qualitative and quantitative methods can be used together. Second, one method may precede another and offer different data types at different times, or one method can be embedded/nested in the other to provide context, supplement and/or check the validity of the dominant method's results. A concurrent nested design, following the collection of data and initial analyses, can help achieve a better and more well-rounded understanding of results as well as their implications (Creswell & Creswell, 2018). Additionally, a concurrent nested design may be utilized to further achieve the validity and reliability of qualitative data that lacks personal input and expression for participants (Aultman, 2020). The survey instrument was developed by the researcher and contains nested, open-ended questions within the primarily quantitative items and will be used for both quantitative and qualitative data collection. The survey data will be

ascertained from each demographic of subjects at one point in time as a one-shot, cross-sectional survey (Fink, 2015).

POPULATION AND SAMPLE

The population for this study includes K-12 education teachers from a school district in southern West Virginia who were actively teaching emergency remote learning classes in the Spring and Fall Semesters of 2020. At the time of this study, the district reported 1,803 teachers who met the inclusion criteria for the sample (National Center for Educational Statistics, 2019). The county granted access for the survey to be distributed to seven schools: two elementary, three middle, and two high schools totaling 175 potential participants who met the inclusion criteria. One elementary, two middles schools, and one high school met the operational definition of "High-Income" with a total of 92 potential participants. The remaining schools met the operational definition for "Low-Income" with 83 potential participants. Data on school income was collected from the West Virginia Chamber of Commerce (WVCC, 2018). The sample was analyzed by elementary, middle school, high school, subject taught, experience, and the designation of low- and high-income.

INSTRUMENT DEVELOPMENT AND VALIDATION

The study utilized a single survey instrument for teachers. The *Teacher Survey: Perception of e-learning during COVID-19* (Appendix C) is a researcher-developed online questionnaire containing five sections. The questions in the survey instrument are based on the research described in Chapter Two. All Likert scale items utilized a five-point scale "Strongly Disagree" (1) to "Strongly Agree" (5). The first section (#1-#3) seeks demographic and descriptive information from the teachers. This includes years of experience, primary subject taught, and institution name. From the name of the institution, the researcher can derive if it

should be categorized as low- or high-income as well as the institutional level. The second section addresses RQ1 and requests respondents to answer a series of Likert scale questions relating to issues surrounding new use, optimism, and feelings of proficiency regarding technology as spurred on by e-learning due to COVID-19. Also, an open-ended question is offered to discover other perceptions and serve as a source of corollary qualitative data to support quantitative findings (O'Cathain & Thomas, 2004). Research suggests that teachers may have negative feelings towards technology due to e-learning but also became more proficient in using it and associated strategies (Kaden, 2020). The third section addresses RQ2 and consists of Likert scale questions on factors that contributed/hindered the teacher's ability to conduct e-learning and open-ended questions to capture additional factors and provide corollary data. All Likert scale questions in this section were derived from already existing research that identified these issues in teachers using e-learning in the pandemic outlined in Chapter Two. The fourth section addresses RQ3 and contains Likert scale questions assessing teachers' experiences with e-learning and how teachers think their students perceived e-learning. It also contains an open-ended question to capture other factors and provide corollary qualitative data. Likert scale questions were based on research that identified common experiences in e-learning as well as a WVDE grading policy on grading that challenged some teachers' grading practices (Dameron, 2020). The fifth and final section addresses RQ4 and again uses Likert scale questions representing what other studies discussed in Chapter Two have found to be factors that contributed to student success or failure. It also contains open-ended questions to capture other factors and provide corollary qualitative data. By utilizing both qualitative and quantitative items, the survey instrument was designed to achieve methodological triangulation, seeking data from the same population using two independent methods (Heale & Noble, 2019).

Methodological triangulation can aid in the confirmation of findings, provide more comprehensive data, and increase the validity of results (Heale & Noble, 2019).

DATA COLLECTION

Once Marshall University's Institutional Review Board (IRB) granted permission (Appendix A), an email was sent to each school's administrator asking permission to distribute surveys electronically to their teachers. Administrators were asked to respond with whether they would grant permission to distribute surveys within five business days from the date the email was sent. The email also contained a study abstract, a teacher consent form (Appendix B), and a copy of the survey instrument. If administrators did not reply within the five-day window, a follow-up phone call was made to the school. A log of administrators who were contacted, as well as their replies, was kept. All administrators who were contacted received a follow-up email once they replied to the initial email thanking them for either their time or their willingness to have their school participate.

Consent forms as well as statements about confidentiality and instructions to participate in the study were included with the link to the electronic survey. Survey instruments were distributed electronically to participating schools via a secured link. Teachers were asked to submit their surveys electronically within two weeks from the date of electronic distribution. Completed teacher surveys are kept secure by the researcher on the online web service the survey was created in and the data will remain there for a period of three years following completion of the study.

DATA ANALYSIS

The data collected to address the research questions were analyzed utilizing several different methods. Each research question was analyzed with both quantitative and nested

qualitative methods for the purpose of data validation. The main quantitative method was an independent samples t-test which was used to discover if there were any statistically significant differences between those teaching in low- and high-income schools. Significance for these t-tests was set at ($p<.05$). Mean scores and standard deviations were calculated for each item as well as the total mean scores on each item of both groups. In addition, a corollary qualitative analysis relied on coding responses based on emergent themes and the rate at which the themes appeared among low- and high-income participant-generated responses. Emergent theme analysis identifies themes through the process of coding participant responses. Common keywords and recurring concerns among participants are used to create themes and sort data (Given, 2008).

Ancillary quantitative data analysis was conducted on the remaining independent variables of institution level, years of experience, and teacher subject area using a one-way analysis of variance test (ANOVA) to determine if significant differences ($p<.05$) exist within each variable based on the research questions. Supporting qualitative data analysis again included coding participant-generated responses based on emergent themes and the rate at which the themes appeared among each of the ancillary demographic variables.

LIMITATIONS

A possible limitation of the study is the sample size. The county in which the study was conducted had only six schools that could meet the definition of "high-income school" as defined by this study. The county administration would only grant permission for seven schools to be used and only under the condition that their principals agreed to allow their teachers to partake in the study. At a 95% confidence level, the margin of error for this sample of the population is 10% (Smith, 2018). While the study could have been expanded to other counties, the county used

in the study had the largest and most diverse student and teacher population and therefore was most suitable for the study. To combat this potential limitation, the schools were chosen based on maintaining a balance of the variables used in the study so that there were near-equal numbers of both high- and low-income teachers. Lastly, as the study asked teachers to critique their employers, the potential for bias is apparent. Survey participants were made aware that their responses would be anonymous and not disclosed to employers to allow for surveys that were more indicative of their actual perceptions.

CHAPTER 4: FINDINGS

INTRODUCTION

The purpose of this study was to discover if there were significant differences in perceptions among K-12 teachers at low-income and high-income schools on e-learning due to COVID-19. The study also sought to collect data concerning how teachers' perceptions of technology may have changed, what factors impacted their ability to conduct e-learning, and what factors most impacted their student's performance during e-learning due to COVID-19. This chapter is organized in the following manner: data collection, presentation of descriptive characteristics of respondents, findings for each research question, ancillary findings, and a summary of the findings. The study was reviewed and approved by the Marshall University Institutional Review Board (Appendix A).

DATA COLLECTION

In April 2021, after receiving permission to conduct the study from Marshall's IRB, a permission email was sent to seven administrators at seven unique schools across a district in southern West Virginia. Each administrator responded to the email within 48 hours and agreed to allow the survey instrument to be distributed to teachers at their respective schools. The self-report online survey, *Teacher Survey: Perception of e-learning During COVID-19,* was distributed via email to 175 faculty members across two elementary schools, three middle schools, and two high schools. After, seven days a reminder email was sent to those who had not responded and did not choose to opt-out of study-related emails. Overall, 60 surveys were returned, representing a return rate of 35%. All returned surveys were answered and deemed usable. Of the 60 usable surveys, 55 answered at least one open-ended question.

DESCRIPTIVE CHARACTERISTICS OF RESPONDENTS

The instrument, *Teacher Survey: Perception of e-learning During COVID-19,* (Appendix C) asked that teachers respond to three demographic and attribute questions from which four variables were derived: school income level, institution level, subject taught, and years of teaching experience. This data is provided in Table 1.

Forty-six-point-six percent (n=28) of respondents taught at the high school level, 31.6% (n=19) taught at the middle school level, and 21.6% (n=13) taught at the elementary level. In total 66.6% (n=40) of respondents came from low-income schools and 33.3% (n=20) came from high-income schools. Eleven-point-six percent (n=7) of respondents indicated they had 1-3 years of teaching experience and 18.6% (n=11) indicated they had 4-5 years of experience. Twenty-six-point-six percent (n=16) of respondents indicated 6-10 years of experience and an additional 26.6% (n=16) of respondents indicated they had taught for 11-16 years. Lastly, 16.6% (n=10) of respondents indicated they had over 17 years of experience. On the survey instrument, first-year teachers were recorded separately than those with 2-3 years of experience. Unexpectedly, only 1 respondent indicated that they were first-year, so the categories were combined for the purposes of data integrity.

One-point-six percent (n=1) recorded their primary subject as career and technical, 13.3% (n=8) percent listed their subject as elementary education, 16.6% (n=10) taught primarily English/language arts, 8.3% (n=5) taught primarily fine arts, 1.6% (n=1) indicated they primarily taught a foreign language, 1.6% (n=1) indicated they primarily taught a JROTC, 18.3% (n=11) indicated they primarily taught math, 1.6% (n=1) indicated they primarily taught music education, 1.6% (n=1) indicated they primarily taught physical education, 3.3% (n=2)) indicated they primarily taught science, 8.3% (n=5) indicated they primarily taught social studies, 13.3%

(n=8) indicated they primarily taught special education, and lastly, 6.6% (n=4) labeled themselves as other. This data is summarized in Table 1.

Table 1 *Demographic Characteristics of Respondents*

Characteristic	N	%
School Income		
Low-income	40	66.6
High-income	20	33.3
Institution Level		
Elementary	13	31.6
Middle	19	21.6
High	28	46.6
Experience		
1-3	7	11.6
4-5	11	18.3
6-10	16	26.6
11-16	16	26.6
17+	10	16.6

N = 60

Of those who responded that they taught in a high school setting, 35% (n=21) reported working at a low-income high school and 11.6% (n=7) reported working at a high-income high school. Of those who responded that they taught at a middle school, 16.6 (n=10) of the respondents were from the low-income middle school, 5% (n=3) were from high-income middle school (a), and an additional 10% (n=6) came from high-income middle school (b). Lastly, of those who responded that they worked at the elementary school level, 15% (n=9) of respondents

came from the low-income elementary school and 6.6 (n=4) came from the high-income elementary school. This data is represented in Table 2.

Table 2 *Location of Respondents*

School	N	%
Low-Income High School	21	35.0
High-Income High School	7	11.6
Low-Income Middle School	10	16.6
High-Income Middle School (a)	3	5.0
High-Income Middle School (b)	6	10.0
Low-Income Elementary School	9	15.0
High-Income Elementary School	4	6.6

N = 60

MAJOR FINDINGS

Four major research questions were addressed in this study. This section presents the findings for each of these questions. Findings are organized by research question.

Change in teachers' perceptions of technology as a result of eLearning due to COVID-19 in low-income vs. high-income schools.

All respondents were asked whether or not their views on technology in the classroom had changed as a result of e-learning due to COVID-19. Respondents answered three survey items using the following five-point Likert scale: 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree. A two-sample t-test ($p < .05$) was used to compare the sample mean for each income to each other with a null hypothesis of no difference between groups. A follow-up open-ended question was asked to capture any responses not addressed by the three Likert scale items. The open-ended question analysis relied on coding responses based on emergent

themes and the frequency at which the themes appear among low- and high-income participant-generated responses.

The mean for the total responses for the survey item 4a, "I use technology more in my face-to-face classes because of experience with e-learning," was 3.55 (SD=1.19). There were no significant differences in mean level ($p > .05$) of use scores between teachers at high-income schools (M=3.60, SD=1.27) and teachers at low-income schools (M=3.45, SD=1.08) for this survey item. The mean for the total responses for survey item 4b, "I see more potential for technology in education because of e-learning," was 3.48 (SD=1.24). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.40, SD=1.21) and teachers at low-income schools (M=3.52, SD=1.31) for this survey item. The mean for the total responses for survey item 4c, "I have more expertise using technology driven strategies in the classroom due to e-learning," was 3.71 (SD=1.10). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.80, SD=1.11) and teachers at low-income schools (M=3.67, SD=1.10) for this survey item. This data is summarized in Table 3.

Table 3 *Change in views of technology as a result of e-learning due to COVID 19*

	High-Income		Low-Income			
Survey Item	M	SD	M	SD	t-stat	Total M Score
More Use in Face-to-Face	3.60	1.27	3.45	1.08	.45	3.55
More Potential for Technology in Education	3.40	1.21	3.52	1.31	-.35	3.48
More Expertise Using Technology in the Classroom	3.80	1.11	3.67	1.10	.41	3.71

N = 60; *p ≤ .05; Scale= 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree.

The open-ended question asked respondents "In what ways, if any, did e-learning due to Covid-19 shift your view of technology's role in education". Fifty responses were provided. Respondents could report multiple ways their views shifted. Emergent theme analysis suggested that teachers at low-income schools were more likely to have a positive shift in their view of technology because of e-learning due to COVID-19. Specifically, teachers at low-income schools cited increased use of technology. Teachers at high-income schools were more likely to have a decreased view of the effectiveness of technology because of e-learning due to COVID-19.

Forty-seven percent of responses stated that their views of technology had been positively impacted. In total, 45% of high-income and 55% of low-income responses noted a positive shift in their views of technology. Positive responses were divided into three commonly occurring themes. These themes were: increased use, increased belief in potential, and increased belief in effectiveness. Three percent of high-income and 18% of low-income responses noted increased use. One respondent indicated "Before e-learning I was gradually using technology but would still lean more towards paper/pencil. Now I use more technology and have become more comfortable with using technology on a daily basis". Nineteen percent of high-income and 23% of low-income responses noted an increased belief in the potential of technology. One respondent indicated "I can implement the use of technology and tech tools more for math now that I have taught a math e-learning. Before (e-learning) I did not rely on any technology at all outside of the occasional calculator app for math." Lastly, 15% of high-income and 14% of low-income responses noted an increased belief in the effectiveness of technology. This was populated by responses such as "I have students submit all their work electronically now. Papers cannot get lost. Time is documented." Seven percent of all responses noted no shift in their

views. Some respondents indicated this by stating “There was no change” or “Did not shift that much. I was already using a good bit of technology.”

The remaining 46% of responses noted e-learning’s negative impact on their view of technology. Negative responses were divided into four commonly occurring themes: the forcing of technology use, technology’s negative effect on students, beliefs of technology’s ineffectiveness, and lack of infrastructure. Seven percent of high-income and 11% of low-income responses noted feelings that technology use is being forced. This was populated by responses such as “It doesn't mean technology is bad or shouldn't be used, but our focus shouldn’t be on figuring out how to squeeze technology in everywhere just for the sake of it.” Next, 7% of high-income and 15% of low-income responses noted technology’s negative impact on students. One respondent indicated “Kindergarteners need to be in the classroom face to face with hands-on experiences! Not sitting in front of a device.” Findings also showed that 30% of high-income and 2% of low-income responses noted increased belief that technology was ineffective. A respondent noted that “It confirmed my belief that technology does more to harm learning than improve it.” Lastly, 3% of high-income and 12% of low-income responses noted increased awareness of a lack of infrastructure to support technology. One respondent indicated “The technology is in place to support e-learning, but the infrastructure, i.e. reliable internet services, are not.” This data is presented in Table 4.

Table 4 *Shifts in views of technology as a result of e-learning due to COVID 19*

Shift in View	High-income School	Low-income School	Total*
Positive Shift	45%	55%	47%
Increased Use	3%	18%	12%
Increased Potential	19%	23%	21%
Increased Effectiveness	15%	14%	13%
No Shift	8%	5%	7%
Negative Shift	47%	40%	46%
Felt Forced	7%	11%	9%
Negative Impact on Students	7%	15%	12%
Decreased View of Effectiveness	30%	2%	15%
Inadequate Infrastructure	3%	12%	9%

*Respondents could note multiple issues N=50

Factors teachers identify as contributing or hindering their ability to effectively conduct e-learning due to COVID-19 in low-income vs. high-income schools.

All respondents were asked to identify factors they believed contributed to or hindered their ability to effectively conduct e-learning during school shutdowns as a result of COVID-19. Respondents answered seven survey items, three dealing with contributing factors and four with hindering factors, using the following five-point Likert scale: 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree. A two-sample t-test ($p < .05$) was used to compare the sample mean for each income to each other with a null hypothesis of no difference between groups. Two follow-up open-ended questions were asked to capture any responses not addressed by the seven Likert scale items. The analysis of the open-ended questions relied on coding

responses based on emergent themes and the frequency at which those themes appeared among low- and high-income participant-generated responses.

For contributing factors, the mean for the total responses for survey item 6a, "I believe Schoology Conference and other recording programs like Zoom contributed to my ability to effectively conduct e-learning," was 3.73 (SD=1.21). There were no significant differences in mean level ($p > .05$) of use scores between teachers at high-income schools (M=3.80, SD=1.19) and teachers at low-income schools (M=3.70, SD=1.27) for this survey item. The mean for the total responses for survey item 6b, "I believe technology based professional development provided by leadership BEFORE e-learning due to COVID-19 contributed to my ability to effectively conduct e-learning," was 3.03 (SD=1.24). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.45, SD=1.21) and teachers at low-income schools (M=2.82, SD=1.13) for this survey item. The mean for the total responses for survey item 6c, "I believe technology based professional development provided by leadership DURING e-learning due to COVID-19 contributed to my ability to effectively conduct e-learning," was 3.25 (SD=1.21). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.65, SD=1.29) and teachers at low-income schools (M=3.05, SD=1.48) for this survey item. This data is summarized in Table 5.

Table 5 *Factors teachers identify as contributing to their ability to effectively conduct e-learning due to COVID-19 in low-incomes vs. high-income schools*

	High-Income		Low-Income			
Survey Item	M	SD	M	SD	t-stat	Total M Score
Recording Programs like Zoom Contributed	3.80	1.19	3.70	1.27	.29	3.73
Technology Based P.D. Before Contributed	3.45	1.21	2.82	1.13	1.82	3.03
Technology Based P.D. During Contributed	3.65	1.29	3.05	1.48	1.88	3.25

N = 60; *p ≤ .05; Scale= 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree.

The first open-ended question asked respondents to "describe any other factors that you believe contributed to your ability to effectively conduct e-learning during COVID-19." Forty-five responses were provided. Respondents could report multiple ways factors that contributed to their ability to conduct e-learning. Analysis of emergent themes on open-ended questions suggested some differences between the two groups. Teachers from high-income schools were more likely to cite their own personal skills or experience as well as administrator support as factors that contributed to effectively conducting e-learning. Teachers from low-income schools were more likely to cite professional development and students committed to learning as factors the contributed to effectively conducting e-learning. Emergent theme analysis also suggests similarities among the two groups. Both mentioned parent involvement, the use of trial and error, and collaboration with other teachers at near-equal rates.

Among responses, nine recurring themes emerged: trial and error, parent involvement, personal skills or experience, professional development, applications/programs, administration, committed students, devices, and collaboration with other teachers. Twelve percent of all respondents, 13% of high-income respondents, and 10% of low-income respondents noted that

their ability to use trial and error and ability to make mistakes without punishment contributed to their ability to effectively conduct e-learning. This was populated by responses such as "I think it was a lot of trial and error from my experience. Working with my students and using their feedback for what worked and what didn't work." Next, 7% percent of all respondents, 7% of high-income respondents, and 7% of low-income respondents noted that parental involvement contributed to their ability to effectively conduct e-learning. One respondent noted, "The only good thing about teaching Kindergarten and 1st Grade e-learning were the parents who would help keep the children focused and finding the right spot to be in when reading writing and working on math". Twenty-nine percent of all respondents, 40% of high-income respondents, and 23% of low-income respondents noted that their own personal skill or experience contributed to their ability to effectively conduct e-learning. This was populated by responses such as "My teaching experience and going above and beyond to do what I could for students during this time is what made e-learning somewhat effective."

Seven percent of all respondents, no high-income respondents, and 10% of low-income respondents noted that professional development contributed to their ability to effectively conduct e-learning. One respondent noted, "I have been to many technology classes during the course of my teaching come alive when I was chosen to be an e-learning teacher, especially Schoology PD's." Eight percent of all respondents, 7% of high-income respondents, and 10% of low-income respondents noted that outside computer applications or programs contributed to their ability to effectively conduct e-learning. This included responses such as "The ability to create demonstration videos and upload those to Schoology allowed my students to view and re-view content." Eight percent of all respondents, 20% of high-income respondents, and 3% of low-income respondents noted that their school's administration contributed to their ability to

effectively conduct e-learning. A respondent within this theme noted, “Support from our administration and county tech-team made a difference.” Eight percent of all respondents, no high-income respondents, and 14% of low-income respondents noted that their students’ commitment to learning contributed to their ability to effectively conduct e-learning. One respondent noted, “Student participation contributed to my ability to effectively conduct e-learning”. Two percent of all respondents, no high-income respondents, and 3% of low-income respondents noted that school-issued devices contributed to the teacher’s ability to effectively conduct e-learning. A respondent noted, “Access to the new MacBook’s, iPads” contributed to his or her ability to effectively conduct e-learning. Lastly, 19% of all respondents, 13% of high-income respondents, and 20% of low-income respondents noted that collaboration with other teachers contributed to their ability to effectively conduct e-learning. One respondent noted, “Leaning on my peers to show me the tricks they know and sharing.” This data is summarized in Table 6.

Table 6 *Factors contributing to effective e-learning due to COVID 19*

Factors	High-income School	Low-income School	Total*
Trial and Error	13%	10%	12%
Parent Involvement	7%	7%	7%
Personal Skills or Experience	40%	23%	29%
Professional Development	0%	10%	7%
Applications or Programs	7%	10%	8%
Support from Administration	20%	3%	8%
Students Committed to Learning	0%	14%	8%
School Issued Devices	0%	3%	2%
Collaboration with Other Teachers	13%	20%	19%

*Respondents could note multiple factors N=45

The remaining survey items focused on the portion of the research question that dealt with factors teachers saw as hindering their ability to effectively conduct e-learning. The mean for the total responses for survey item 8a, "I feel a lack of e-learning centered professional development challenged my ability to conduct an effective e-learning class," was 2.67 (SD=1.06). There were no significant differences in mean level ($p > .05$) of use scores between teachers at high-income schools (M=2.35, SD=1.00) and teachers at low-income schools (M=2.82, SD=0.87) for this survey item. The mean for the total responses for survey item 8b, "I feel that the sudden nature of the transition to e-learning challenged my ability to conduct an effective e-learning class," was 3.40 (SD=0.96). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.35, SD=1.05) and teachers at low-income schools (M=3.42, SD=1.18) for this survey item. The mean for the total responses for survey item 8c, "I feel the frequency of technical issues challenged my ability to

conduct an effective e-learning class," was 3.61 (SD=1.09). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.65, SD=0.96) and teachers at low-income schools (M=3.60, SD=1.48) for this survey item. The mean for the total responses for survey item 8d, "My lack of a device or internet access challenged my ability to conduct an effective e-learning class," was 1.95 (SD=1.12). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=2.10, SD=1.56) and teachers at low-income schools (M=1.87, SD=1.59) for this survey item. This data is summarized in Table 7.

Table 7 *Factors teachers identify as hindering their ability to effectively conduct e-learning due to COVID-19 in low-incomes vs. high-income schools*

	High-Income		Low-Income			
Survey Item	M	SD	M	SD	t-stat	Total M Score
Lack of P.D. Hindered	2.35	1.10	2.02	0.87	-1.69	2.67
Sudden Transition Hindered	3.35	1.05	3.42	1.18	-.29	3.40
Frequency of Tech Issues Hindered	3.65	0.96	3.60	1.40	.15	3.61
Personal Lack of a Device or Internet Access Hindered	2.10	1.56	1.87	1.59	.64	1.95

N = 60; *p ≤ .05; Scale= 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree.

The second open-ended question asked respondents to "describe any other factors that you believe hindered your ability to conduct an effective e-learning class during COVID-19." Forty-two responses were provided. Respondents could report multiple factors that contributed to their ability to conduct e-learning. Analysis of emergent themes on open-ended questions suggested some differences between the two groups. Teachers from high-income schools were more likely to cite a lack of access to services and unfamiliarity with e-learning in the learning

community as factors that hindered effectively conducting e-learning. Teachers from low-income schools were more likely to cite a lack of administrative support and a lack of parental support as factors the hindered their ability to conduct e-learning. Emergent theme analysis also suggests similarities among the two groups. Both mentioned student's unwillingness to participate most frequently and at near-equal rates.

Among responses, five recurring themes emerged: issues with access, students unwilling to participate, unfamiliarity with the concept of e-learning, lack of administrative support, and lack of parental support. Thirty-three percent of all respondents, 54% of high-income respondents, and 26% of low-income respondents noted that issues with student access to the internet and devices hindered their ability to effectively conduct e-learning. This was based on responses such as "the frequency of the technical issues with Schoology, and our internet going out occasionally at the school was a HUGE issue this year. There were multiple days where I would have to cancel class" and "students not having access from home." Thirty-six percent of all respondents, 28% of high-income respondents, and 39% of low-income respondents noted that students' unwillingness to participate in their course hindered their ability to effectively conduct e-learning. One respondent noted, "Students not participating in Schoology conferences or being held accountable." Ten percent of all respondents, 18% of high-income respondents, and 6% of low-income respondents noted that teacher or student unfamiliarity with the concept of e-learning hindered their ability to effectively conduct e-learning. This was created based on responses such as "Not knowing all of the ins and outs of the Schoology conferencing system. I was taught, but I felt like it was a crash course and issues came up as I was trying to teach that could not be answered in my building." Fourteen percent of all respondents, 54% of high-income respondents, and 19% of low-income respondents noted that a lack of administrative support

hindered their ability to effectively conduct e-learning. One respondent noted, "County admin NEVER gave us a specific and outlined directive on how to conduct e-Learning, they showed us all the things we could use then essentially walked away and expected us to keep all students learning." Seven percent of all respondents, no high-income respondents, and 10% of low-income respondents noted that a lack of parental support hindered their ability to effectively conduct e-learning. A respondent noted, "The disparity between students who came from good homes, and those who had troubled homes became very apparent. E-Learners from troubled homes did not get enough support because simply making contact was extremely difficult." This data is summarized in Table 8.

Table 8 *Factors hindering effective e-learning due to COVID 19*

Factors	High-income School	Low-income School	Total*
Lack of Access for Students	54%	26%	33%
Students' Unwillingness to Participate	28%	39%	36%
Unfamiliarity with e-learning	18%	6%	10%
Lack of Administrative Support	0%	19%	14%
Lack of Parental Support	0%	10%	7%

*Respondents could note multiple factors N=42

Teachers' experiences with eLearning due to COVID-19 in low-income vs. high-income schools.

All respondents were asked to elaborate on their experiences with eLearning due to COVID-19. Respondents answered five survey items, using the following five-point Likert scale: 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree. A two-sample t-test ($p < .05$) was used to compare the sample mean for each income to each other with a null hypothesis of no difference between groups. A follow-up open-ended question was asked to

capture any responses not addressed by the five Likert scale items. The open-ended question analysis relied on coding responses based on emergent themes and the frequency at which the themes appear among low- and high-income participant-generated responses.

For contributing factors, the mean for the total responses for survey item 10a, "I believe e-learning should continue to have some role in the K-12 environment," was 2.80 (SD=1.06). There were no significant differences in mean level ($p > .05$) of use scores between teachers at high-income schools (M=2.60, SD=0.75) and teachers at low-income schools (M=2.90, SD=1.21) for this survey item. The mean for the total responses for survey item 10b, "I amended my classroom policies on late work and grading to be more accommodating for struggling students during e-learning due to COVID-19," was 4.30 (SD=0.95). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=4.00, SD=1.27) and teachers at low-income schools (M=4.50, SD=1.57) for this survey item. The mean for the total responses for survey item 10c, "I believe disallowing grades to drop below their pre-pandemic level was an appropriate policy decision during e-learning in the Spring Semester of 2020," was 2.56 (SD=1.39). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=2.95, SD=1.47) and teachers at low-income schools (M=2.37, SD=1.47) for this survey item. The mean for the total responses for survey item 10d, "I believe some students found more success in an e-learning setting than a traditional in-person setting," was 3.15 (SD=1.45). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.20, SD=1.00) and teachers at low-income schools (M=3.12, SD=1.14) for this survey item. The mean for the total responses for survey item 10e, "I believe separation from a traditional in-person classroom setting negatively impacted students," was 4.13 (SD=1.04). There were no significant differences

in mean level ($p > .05$) of scores between teachers at high-income schools (M=4.05, SD=1.07) and teachers at low-income schools (M=4.17, SD=0.75) for this survey item. This data is summarized in Table 9.

Table 9 *Experiences with eLearning due to COVID-19*

	High-Income		Low-Income			
Survey Item	M	SD	M	SD	t-stat	Total M Score
e-learning Should Continue	2.60	.75	2.90	1.21	-.69	2.80
Amended Classroom Policies	4.00	1.27	4.50	1.57	-1.68	4.30
Disallowing Grades to Drop Was Appropriate	2.95	1.47	2.37	1.47	1.41	2.56
Some Students More Successful In e-learning Than Traditional Class	3.20	1.00	3.12	1.14	.18	3.15
Separation from In-Person Classroom Hurt Students	4.05	1.07	4.17	.75	-.41	4.13

$N = 60$; *$p \leq .05$; Scale= 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree.

The open-ended question asked respondents "Did your classroom expectations change during the switch to e-learning, if so, how?". Fifty responses were provided. Respondents could report multiple ways their views shifted. Analysis of emergent themes on open-ended questions suggested some differences between the two groups. Teachers from high-income schools were more likely to mention their flexibility with late work as well as decreased rigor in their class as ways their expectations changed. Teachers from low-income schools were more likely to mention an increased awareness of socio-economic disadvantage or say their expectations did not change during e-learning.

Among responses, six recurring themes emerged: increased flexibility on grading and late work, lower expectations of student performance, decreased rigor, increased awareness of

plagiarism, increased awareness of economic disadvantage, and no change in policy. Forty-five percent of all respondents, 54% of high-income respondents, and 42% of low-income respondents noted that their classroom expectations changed as a result of e-learning in so much as they had increased flexibility on grading and late work. One respondent indicated "I have adapted my grading policies to accept late work with no penalties, and I no longer grade giving zeros and not just for e-learners." Six percent of all respondents, 9% of high-income respondents, and 3% of low-income respondents noted that their classroom expectations changed as a result of e-learning in so much as they had decreased expectations of student performance. This was populated with responses such as "Because I was unable to see them do the work as they were doing it, you either did it or you didn't. You get a grade for turning it in completed." Eight percent of all respondents, 14% of high-income respondents, and 3% of low-income respondents noted that their classroom expectations changed as a result of e-learning in so much as they decreased the amount of rigor in their classes. One respondent indicated "I had to abolish my late work penalty and accept less than stellar work in order to ensure some students passed." Four percent of all respondents, 9% of high-income respondents, and no low-income respondents noted that their classroom expectations changed as a result of e-learning in so much as they had increased awareness of plagiarism in student work. This was populated by responses such as "I could not monitor their progress and give them suggestions and support along the way in the same way I would if they were in the classroom. Requiring them to show me each step also makes it harder to plagiarize, which was a concern for me." Twenty-five percent of all respondents, 9% of high-income respondents, and 35% of low-income respondents noted that their classroom expectations changed as a result of e-learning in so much as they had increased awareness of the effects of economic disadvantage among students. A respondent noted, "I

cannot and will not hold students "accountable" for their economic situation." Twelve percent of all respondents, 5% of high-income respondents, and 17% of low-income respondents noted that their classroom expectations did not change as a result of e-learning due to COVID-19. A respondent noted, "My expectations stayed the same, adversity happens." This data is summarized in Table 10.

Table 10 *Change in classroom expectations during e-learning due to COVID 19*

Factors	High-income School	Low-income School	Total*
More Flexibility in Grading and Late Work	54%	42%	45%
Decrease Expectation of Student Performance	9%	3%	6%
Decreased Rigor in the classroom	14%	3%	8%
Increased Awareness of Plagiarism	9%	0%	4%
Increased Awareness of Economic Disadvantage	9%	35%	25%
No Change in Classroom Expectation	5%	17%	12%

*Respondents could note multiple factors N=50

Teachers' perceptions of how eLearning due to COVID-19 impacted their students in low-income vs high-income schools.

All respondents were asked to elaborate on how they believed e-learning due to COVID-19 impacted their students. Respondents answered nine survey items, using the following five-point Likert scale: 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree. A two-sample t-test ($p < .05$) was used to compare the sample mean for each income to each other with a null hypothesis of no difference between groups. Two follow-up open-ended questions were asked to capture any responses not addressed by the nine Likert scale items. The analysis of the open-ended questions relied on coding responses based on emergent themes and the

frequency at which those themes appeared among low- and high-income participant-generated responses.

The first section, containing four survey items, asked teachers what things had positive effects on students. The mean for the total responses for survey item 12a, “I believe school-issued iPads contributed to the success of students who performed well in e-learning,” was 4.17 (SD=0.97). There were no significant differences in mean level ($p > .05$) of use scores between teachers at high-income schools (M=4.35, SD=1.07) and teachers at low-income schools (M=4.07, SD=0.74) for this survey item. The mean for the total responses for survey item 12b, “I believe buses and school provided hotspots contributed to the success of students who performed well in e-learning,” was 3.48 (SD=1.18). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.60, SD=1.10) and teachers at low-income schools (M=3.42, SD=1.35) for this survey item. The mean for the total responses for survey item 12c, “I believe support from parents and other resources at home contributed to the success of students who performed well in e-learning,” was 4.25 (SD=1.09). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=4.45, SD=1.18) and teachers at low-income schools (M=4.15, SD=0.88) for this survey item. The mean for the total responses for survey item 12d, “I believe students' previous experience with e-learning classes contributed to the success of students who performed well in e-learning,” was 3.15 (SD=1.25). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.15, SD=1.25) and teachers at low-income schools (M=3.15, SD=0.93) for this survey item. This data is summarized in Table 11.

Table 11 *Things that positively impacted students during eLearning due to COVID-19*

	High-Income		Low-Income			
Survey Item	M	SD	M	SD	t-stat	Total M Score
School-issued iPads Contributed	4.35	1.07	4.07	.74	1.15	4.17
Buses and School Hotspots Contributed	3.60	1.10	3.42	1.35	.50	3.48
Support from Parents Contributed	4.45	1.18	4.15	.88	1.09	4.25
Students' Previous Experience with e-learning Contributed	3.15	1.25	3.15	.93	0	3.15

N = 60; *p ≤ .05; Scale= 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree.

The first open-ended question asked respondents to comment on "factors or circumstances that you believe might be attributed to students who performed well in e-learning.". Thirty-six responses were provided. Respondents could report multiple factors that contributed to their ability to conduct e-learning. Analysis of emergent themes on open-ended questions suggested some differences between the two groups. Teachers from high-income schools were more likely to cite strong in-person performance by a student as a factor that contributed to good student performance during e-learning. Teachers from low-income schools were more likely to mention support from parents as a factor the contributed to good student performance during e-learning. Emergent theme analysis also suggests similarities among the two groups. Both mentioned a student's personal discipline as a factor in good performance during e-learning at near-equal rates.

Among responses, five recurring themes emerged: strong in-person performance, parent involvement, personal discipline, reliable access to the internet, and high-quality teachers. Nineteen percent of all respondents, 33% of high-income respondents, and 12% of low-income respondents noted that strong performance in an in-person setting was a main attribute of

students who performed well in e-learning. A respondent noted, “Students with a strong past academic performance that made the switch to e-learning, for the most part, tended to do better.” Forty-five percent of all respondents, 33% of high-income respondents, and 50% of low-income respondents noted that supportive, involved parents/guardians were a main attribute of students who performed well in e-learning. One respondent noted, “Parent support is the only way for them to be successful.” Twenty-two percent of all respondents, 25% of high-income respondents, and 22% of low-income respondents noted that high amounts of self-discipline was a main attribute of students who performed well in e-learning. This was populated with responses such as “Students that are self-disciplined and self-starters are always going to do well in just about any learning situation.” Eight percent of all respondents, 8% of high-income respondents, and 9% of low-income respondents noted that reliable access to the internet was a main attribute of students who performed well in e-learning. A respondent noted, “Students with the right technology and the right internet connection had a chance to do well.” Six percent of all respondents, no high-income respondents, and 9% of low-income respondents noted that having high-quality teachers was a main attribute of students who performed well in e-learning. This was populated by responses such as “Having teachers who were consistent and maintain a routine with their expectations and communication.” This data is summarized in Table 12.

Table 12 *Factors attributed to students who performed well during e-learning due to COVID 19*

Factors	High-income School	Low-income School	Total*
Strong In-Person Performance	33%	12%	19%
Parent Involvement	33%	50%	45%
Personal Student Discipline	25%	20%	22%
Reliable Access to the Internet	8%	9%	8%
High-Quality Teachers	0%	9%	6%

*Respondents could note multiple factors

The remaining survey items in this section focused on things teachers perceived as negatively impacting their students. The mean for the total responses for survey item 14a, "I believe a lack of internet access at home contributed to the shortcoming of students who performed poorly in e-learning," was 4.10 (SD=1.03). There were no significant differences in mean level ($p > .05$) of use scores between teachers at high-income schools (M=4.30, SD=1.13) and teachers at low-income schools (M=4.00, SD=0.80) for this survey item. The mean for the total responses for survey item 14b, "I believe a lack of devices contributed to the shortcoming of students who performed poorly in e-learning," was 2.28 (SD=1.29). There was a significant statistical difference in mean level ($p < .05$) of scores between teachers at high-income schools (M=1.75, SD=1.28) and teachers at low-income schools (M=2.55, SD=1.16) for this survey item. The mean for the total responses for survey item 14c, "I believe hardships caused by the virus and resulting shutdowns contributed to the shortcoming of students who performed poorly in e-learning," was 3.78 (SD=1.23). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=3.90, SD=1.32) and teachers at low-income schools (M=3.72, SD=1.07) for this survey item. The mean for the total responses for survey item 14d, "I believe a lack of support from home contributed to the shortcoming of students who

performed poorly in e-learning," was 4.65 (SD=0.63). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=4.65, SD=0.62) and teachers at low-income schools (M=4.65, SD=0.67) for this survey item. The mean for the total responses for survey item 14e, "I believe a lack of discipline for self-directed learning contributed to the shortcoming of students who performed poorly in e-learning," was 4.63 (SD=0.78). There were no significant differences in mean level ($p > .05$) of scores between teachers at high-income schools (M=4.65, SD=0.86) and teachers at low-income schools (M=4.62, SD=0.58) for this survey item. This data is summarized in Table 13.

Table 13 *Things that negatively impacted students during eLearning due to COVID-19*

	High-Income		Low-Income			
Survey Item	M	SD	M	SD	t-stat	Total M Score
Lack of Internet Access Hindered	4.30	1.13	4.00	0.80	1.18	4.10
Lack of Devices Hindered	1.75	1.28	2.55	1.16	-2.42*	2.28
Hardships Caused by the Virus Hindered	3.90	1.32	3.72	1.07	.55	3.78
Lack of Support from Home Hindered	4.65	.67	4.65	.67	.0	4.65
Lack of Discipline for Self-Directed Learning Hindered	4.65	.86	4.62	.58	.13	4.63

N = 60; *p ≤ .05; Scale= 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree.

The second open-ended question asked respondents to comment on "factors or circumstances that you believe might be attributed to students who underperformed in e-learning." Thirty-two responses were provided. Respondents could report multiple factors that contributed to their ability to conduct e-learning. Analysis of emergent themes on open-ended questions suggested some differences between the two groups. Teachers from high-income schools were more likely to cite a lack of parental support as a factor that contributed to poor

student performance during e-learning. Teachers from low-income schools were more likely to cite a lack of internet access and inexperienced teachers as factors that contributed to poor student performance.

Among responses, five recurring themes emerged: low socioeconomic status, lack of parent involvement, lack of personal discipline, lack of reliable access to the internet, and teacher inexperience. Twenty-two percent of all respondents, 28% of high-income respondents, and 20% of low-income respondents noted that a low socioeconomic status was an attribute of students who underperformed in e-learning. One respondent noted, "some students had to try to juggle their school-work while caring for younger siblings, taking care of household chores, cooking, or even providing for their family by working." Thirty-one percent of all respondents, 57% of high-income respondents, and 24% of low-income respondents noted that a lack of parental support was an attribute of students who underperformed in e-learning. This was populated by responses such as "No drive and no one there to help them was the main issue. Most of my online students had zero support at home and that is why they never showed up." Nineteen percent of all respondents, no high-income respondents, and 12% of low-income respondents noted that a lack of reliable access to the internet was an attribute of students who underperformed in e-learning. Twenty-two percent of all respondents, 15% high-income respondents, and 24% of low-income respondents noted that a lack of student personal discipline was an attribute of students who underperformed in e-learning. A respondent indicated "students are not motivated to pass their classes. They know that most teachers will give them multiple (sometimes endless) chances to make up work." Sixteen percent of all respondents, no high-income respondents, and 20% of low-income respondents noted that having inexperienced teachers was an attribute of students who underperformed in e-learning. One respondent indicated that "There is still a lack of

willingness from more traditional teachers to really dive in and use technological assets that are right in front of them." This data is summarized in Table 14.

Table 14 *Factors that contributed to poor student performance during e-learning*

Factors	High-income School	Low-income School	Total*
Low Socio-Economic Status	28%	20%	22%
Lack of Parent Involvement	57%	24%	31%
Lack of Personal Student Discipline	15%	24%	22%
Lack of Reliable Access to the Internet	0%	12%	16%
Teacher Inexperience	0%	20%	19%

*Respondents could note multiple factors N=32

ANCILLARY FINDINGS

In addition to the income variable, secondary variables were analyzed to supplement the research and determine if there were any statistically significant differences among them. Secondary variables analyzed included: school level, teacher experience, and subject taught. No statistically significant findings were discovered when the data was analyzed from the basis of school level (Elementary, Middle, High) and subject taught by the teacher. Analyzing the data from the perspective of experience level, instead of school income, yielded two statistically significant results.

Experience level.

A one-way ANOVA test was conducted to determine the effects of experience level on teacher perspectives of e-learning due to COVID-19. Sample means were grouped into five categories: 1-3, 4-5,6-10, 11-16, and 17+ years of experience.

The survey item 8d, "My lack of a device or internet access challenged my ability to conduct an effective e-learning class," yielded significant differences in mean levels ($p < .05$) of

scores between teachers with 1-3 years of experience (M=1.43, SD=.61), teachers with 4-5 years of experience (M=1.37, SD=.85), teachers with 6-10 years of experience (M=2.00, SD=.66), teachers with 11-16 years of experience (M=2.50, SD=1.4), and teachers with 17 or more years of experience (M=2.00, SD=1.4). A post hoc t-test for independent samples ($p < .05$) revealed that a statistically significant difference existed between the 1–3 years of experience group and the 11-16 group as well as the 4-5 group and the 11-16 group.

The survey item 14b, "I believe a lack of devices contributed to the shortcoming of students who performed poorly in e-learning," yielded significant differences in mean levels ($p < .05$) of scores between teachers with 1-3 years of experience (M=3.40, SD=2.61), teachers with 4-5 years of experience (M=2.50, SD=1.30), teachers with 6-10 years of experience (M=2.20, SD=1.70), teachers with 11-16 years of experience (M=1.50, SD=.40), and teachers with 17 or more years of experience (M=2.50, SD=2.00). A post hoc t-test for independent samples ($p < .05$) revealed that a statistically significant difference existed between the 1–3 years of experience group and the 11-16 group as well as the 4-5 group and the 11-16 group. This data is summarized in Table 15.

Table 15 *Analysis of data based on teacher years of experience*

Survey Item	1-3 Years		4-5 Years		6-10 Years		11-16 Years		17+ Years		
	M	SD	M	SD	M	SD	M	SD	M	SD	F
My Lack of Device	1.43	.61	1.37	0.85	2.00	.66	2.50	1.80	2.00	1.40	2.53*
Student Lack of Device	3.40	2.60	2.50	1.30	2.20	1.70	1.50	.40	2.50	2.00	2.50*

N = 60; *p ≤ .05; Scale= 1=Strongly Disagree. 2=Disagree. 3=Neutral. 4=Agree. 5=Strongly Agree.

SUMMARY OF FINDINGS

Three Likert scale survey items, focusing on the change in views of technology brought on by e-learning due to COVID-19, produced no statistically significant differences among the mean scores of teachers at low-income and high-income schools. A corollary analysis of the open-ended question revealed that teachers at low-income schools were more likely to note a positive shift in their view of technology as compared to teachers at high-income schools. Seven Likert scale survey items, focusing on teacher-identified factors that contributed to or hindered their ability to conduct e-learning during COVID-19, produced no statistically significant differences among the mean scores of teachers at low-income and high-income schools. A post hoc, corollary analysis of two open-ended questions revealed that teachers at high-income schools were more likely to note personal experience and administrative support as contributing to their ability to effectively conduct e-learning, while teachers at low-income schools were more likely to note professional development and their students' commitment to education as contributing to their ability to effectively conduct e-learning. Teachers at low-income schools were more likely to note a lack of student participation and administrative support as factors that hindered their ability to effectively conduct e-learning, while teachers at high-income schools were more likely to note a lack of internet access or access to their learning management system as a factor that hindered their ability to effectively conduct e-learning.

Five Likert scale survey items, on teacher experiences with e-learning during COVID-19, produced no statistically significant differences among the mean scores of teachers at low-income and high-income schools. A corollary analysis of open-ended questions revealed that teachers at high-income schools were more likely to have changed their classroom by being more flexible or having less rigor in their coursework, while teachers at low-income schools were

more likely to have no change to their teaching method and awareness of the impact of low socioeconomic status on students. Eight Likert scale survey items, focusing on teacher-identified factors that impacted student performance in an e-learning environment during COVID-19, produced no statistically significant differences among the mean scores of teachers at low-income and high-income schools. One Likert scale survey item, "I believe a lack of devices contributed to the shortcoming of students who performed poorly in e-learning," did produce a statistically significant difference between the mean scores of teachers at low- and high-income schools.

A corollary analysis of two open-ended questions revealed that teachers at high-income schools were more likely to note strong in-person performance before e-learning as a factor that contributed to good student performance in e-learning, while teachers at low-income schools were more likely to note parental support and access to high-quality teachers as factors that contributed to good student performance during e-learning. Teachers at low-income schools were more likely to note a lack of teacher experience and internet access as factors that contributed to poor student performance during e-learning, while teachers at high-income schools were more likely to note a lack of parental support as a factor that contributed to poor student performance during e-learning.

Lastly, ancillary ANOVA testing revealed two statistically significant differences in mean scores among those with different levels of experience. After a post hoc t-test, the survey item 8d, "My lack of a device or internet access challenged my ability to conduct an effective e-learning class," revealed that the statistically significant difference existed between the 1–3 years of experience group and the 11-16 group as well as the 4-5 group and the 11-16 group. The 11-16 group was more likely to say that their lack of device hindered their ability to conduct e-

learning than both the 1-3 and 4-5 year group. Similarly, the survey item 14b, “I believe a lack of devices contributed to the shortcoming of students who performed poorly in e-learning,” revealed that the statistically significant difference existed between the 1–3 years of experience group and the 11-16 year group as well as the 4-5 group and the 11-16 group. The 11-16 group was less likely to agree that a lack of devices hurt student performance than both the 1-3 and 4-5 year group.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

This chapter reviews the purpose of the study and summarizes the demographic data, methods, and findings. The chapter ends by presenting the study conclusions, a discussion of its implications, and recommendations for future study.

PURPOSE OF THE STUDY

The purpose of this study was to discover if there were significant differences in opinion among K-12 teachers at low-income and high-income schools on e-learning due to COVID-19. The study also sought to collect data concerning how teachers' perceptions of technology may have changed, what factors impacted their ability to conduct e-learning, and what factors most impacted their student's performance during e-learning due to COVID-19.

RESEARCH QUESTIONS

The following research questions were investigated:

1. What differences, if any, are there in how teachers' perception of technology in the classroom changed as a result of eLearning due to COVID-19 in low-income vs. high-income schools?
2. What differences, if any, are there in the factors teachers identify as contributing or hindering their ability to effectively conduct e-learning due to COVID-19 in low-income vs. high-income schools?
3. What differences, if any, are there in teachers' experiences with eLearning due to COVID-19 in low-income vs. high-income schools?
4. What differences, if any, are there in teachers' perceptions of how eLearning due to COVID-19 impacted their students in low-income vs high-income schools?

DATA COLLECTION

In April 2021, after receiving permission to conduct the study from district leadership, a permission email was sent to seven administrators at seven unique schools across a district in southern West Virginia. Each administrator responded to the email within 48 hours and agreed to allow the survey instrument to be distributed to teachers at their respective schools. The self-report online survey, *Teacher Survey: Perception of e-learning During COVID-19,* was distributed via email to 175 faculty members across two elementary schools, three middle schools, and two high schools. Overall, 60 surveys were returned, representing a return rate of 35%.

The high school level was defined as grades 9-12 and represented 46.6% percent (n=28) of respondents. The middle school level was defined as grades 6-8 and represented 31.6% (n=19) of respondents. Lastly elementary was defined as grades k-5 and represented 21.6% (n=13) of respondents. In total 66.6% (n=40) of respondents came from low-income schools and 33.3% (n=20) came from high-income schools. Eleven-point-six percent (n=7) of respondents indicated they had 1-3 years of teaching experience and 18.6% (n=11) indicated they had 4-5 years of experience. Twenty-six-point-six percent (n=16) of respondents indicated 6-10 years of experience and an additional 26.6% (n=16) of respondents indicated they had taught for 11-16 years. Lastly, 16.6% (n=10) of respondents indicated they had over 17 years of experience.

Only 1.6% (n=1) recorded their primary subject as career and technical, 13.3% (n=8) percent listed their subject as elementary education, 16.6% (n=10) taught primarily English/language arts, 8.3% (n=5) taught primarily fine arts, 1.6% (n=1) indicated they primarily taught a foreign language, 1.6% (n=1) indicated they primarily taught a JROTC, 18.3% (n=11) indicated they primarily taught math, 1.6% (n=1) indicated they primarily taught music

education, 1.6% (n=1) indicated they primarily taught physical education, 3.3% (n=2)) indicated they primarily taught science, 8.3% (n=5) indicated they primarily taught social studies, 13.3% (n=8) indicated they primarily taught special education, and lastly, 6.6% (n=4) labeled themselves as other.

SUMMARY OF FINDINGS

After conducting a t-test for independent samples on 24 Likert scale survey items, 23 produced no statistically significant differences among the mean scores of teachers at low-income and high-income schools. One Likert scale survey item, "I believe a lack of devices contributed to the shortcoming of students who performed poorly in e-learning," did produce a statistically significant difference between the mean scores of teachers at low- and high-income schools. Teachers at low-income schools were significantly more likely to agree that a lack of device hurt student performance during e-learning.

Emergent theme analysis on six open-ended questions, serving as a post hoc corollary to the quantitative data, revealed that teachers at low-income schools were more likely to note a positive shift in their view of technology as compared to teachers at high-income schools. Teachers at high-income schools were more likely to note personal experience and administrative support as contributing to their ability to effectively conduct e-learning, while teachers at low-income schools were more likely to note professional development and their students' commitment to education as contributing to their ability to effectively conduct e-learning. Teachers at low-income schools were more likely to note a lack of student participation and administrative support as factors that hindered their ability to effectively conduct e-learning, while teachers at high-income schools were more likely to note a lack of internet access or access

to their learning management system as a factor that hindered their ability to effectively conduct e-learning.

Teachers at high-income schools were more likely to have changed their classroom by being more flexible and having less rigor in their coursework, while teachers at low-income schools were more likely to have no change to their teaching methods and to have gained awareness of the impact of low socioeconomic status on students. Also, teachers at high-income schools were more likely to note strong in-person performance before e-learning as a factor that contributed to good student performance in e-learning, while teachers at low-income schools were more likely to note parental support and access to high-quality teachers as factors that contributed to good student performance during e-learning. Teachers at low-income schools were more likely to note a lack of teacher experience and internet access as factors that contributed to poor student performance during e-learning, while teachers at high-income schools were more likely to note a lack of parental support as a factor that contributed to poor student performance during e-learning.

Lastly, ancillary ANOVA testing revealed two statistically significant differences in mean scores among those with different levels of experience. After a post hoc t-test, the survey item 8d, "My lack of a device or internet access challenged my ability to conduct an effective e-learning class," revealed that the statistically significant differences existed between the 1–3 years of experience group and the 11-16 group as well as the 4-5 group and the 11-16 group. The 11-16 group was significantly more likely to agree that their lack of device hindered their ability to conduct e-learning than both the 1-3 and 4-5 groups. Similarly, the survey item 14b, "I believe a lack of devices contributed to the shortcoming of students who performed poorly in e-learning," revealed that the statistically significant difference existed between the 1-3 years of

experience group and the 11-16 group as well as the 4-5 group and the 11-16 group. The 1-3 and 4-5 groups were significantly more likely to agree that lack of devices hurt student performance than the 11-16 group.

CONCLUSIONS

The data collected for this study provided sufficient evidence to support the following conclusions.

Research Question 1: What differences, if any, are there in how teachers' perceptions of technology in the classroom changed as a result of eLearning due to COVID-19 in low-income vs. high-income schools?

No statistically significant differences were found among the three Likert scale items in the survey dealing with changes in a teacher's view of technology as a result of e-learning due to COVID-19. Open-ended responses revealed that teachers at low-income schools were more likely to experience a positive shift in their view of technology as a result of e-learning due to COVID-19. Teachers at low-income schools were also more likely to indicate increased use of technology in the classroom in open-ended questions. Teachers at high-income schools were much more likely to view technology as less effective as a teaching tool as a result of e-learning due to COVID-19. Overall, teachers at low-income schools tended to have a more positive opinion of technology and be more apt to increase its use. Teachers at high-income schools tended to see flaws in technology and view it as less effective.

Research Question 2: What differences, if any, are there in the factors teachers identify as contributing or hindering their ability to effectively conduct e-learning due to COVID-19 in low-income vs. high-income schools?

No statistically significant differences were found among the seven Likert scale items in the survey dealing with factors that contributed to or hindered a teacher's ability to conduct e-learning. Open-ended responses revealed that teachers at low-income schools were more likely to contribute their effective e-learning courses to their professional development and students committed to learning. Teachers at high-income schools were much more likely to attribute their effective e-learning courses to their own personal skill and experience as well as support from their administration. In regard to factors that hindered effectively conducted e-learning, teachers at low-income schools were more likely to cite a lack of support from administration, lack of parental support, and student's choosing not to participate. Teachers at high-income schools were more likely to cite a lack of access to the internet or the LMS Schoology and unfamiliarity with the structure of e-learning in the school community as factors that hindered effective e-learning.

Research Question 3: What differences, if any, are there in teachers' experiences with eLearning due to COVID-19 in low-income vs. high-income schools?

No statistically significant differences were found among the five Likert scale items in the survey dealing with teacher's experiences with e-learning during COVID-19. Open-ended responses revealed that teachers at low-income schools were much more likely to have gained awareness of the impact of socio-economic factors in a student's academic experience and more likely to make no changes to their classroom policies in light of e-learning and the pandemic. Teachers at high-income schools were much more likely to decrease the overall rigor of their courses and more likely to be more flexible in their grading policies.

Research Question 4: What differences, if any, are there in teachers' perceptions of how eLearning due to COVID-19 impacted their students in low-income vs high-income schools?

No statistically significant differences were found in eight of the nine Likert scale items in the survey dealing with teacher perceptions of e-learning's impact on students. A statistically significant difference was discovered between teachers at high- and low-income schools on the issue of student devices. Low-income teachers were more likely to believe that a lack of student devices was a factor in students who performed poorly during e-learning. Open-ended responses revealed that teachers at low-income schools were much more likely to attribute high levels of parental involvement to students who found success during e-learning. Teachers at low-income schools also were more likely to cite issues with home internet access and teacher inexperience as factors that contributed to poor student performance during e-learning. Teachers at high-income schools were much more likely to attribute strong in-person performance as a factor that led students to find success during e-learning. Teachers at high-income schools were also much more likely to note a lack of parental involvement as a factor in students who performed poorly during e-learning.

DISCUSSION AND IMPLICATIONS

Quantitative methods produced a single statistically significant result when analyzed from the perspective of teachers at low-income schools vs. high-income schools. Based on the results of the t-test, low-income teachers were significantly more likely to claim that a lack of student devices contributed to poor student performance during e-learning due to COVID-19. It follows that without a device to complete a digital curriculum, students would fail to perform well and that this situation was more likely to occur in low-income schools (National Center for

Education Statistics, 2018b). This result is consistent with previous research that shows that low-income students are more likely to break, lose, or otherwise render school-issued devices inoperable (J-PAL, 2019). Students with inoperable devices would have been disconnected from school-based information technology (I.T.) support or at the very least, the pandemic would have made replacing or repairing these devices more difficult. School-issued devices often have fees associated with their replacing/repairing that low-income families struggle to pay (Herold, 2019). Low-income students are also most likely to rely on school-issued devices as their sole means of access to the internet, which was essential during the pandemic, and the main reason behind the creation of 1:1 device programs (Kassinger, 2019). It would appear the effectiveness of the 1:1 program in the district was questionable to teachers in low-income schools and they were not convinced their students had the devices necessary to perform well during the pandemic. More quantitative research may be needed to confirm these perceptions but it could be necessary for districts with many low-income schools to review their 1:1 device programs to ensure its effectiveness in connecting students.

In open-ended questions, some respondents mentioned that even without a school-issued device, students had access to their mobile phones and therefore, should not have had their performance negatively affected. Yet, research suggests students tend to be less effective in their schoolwork when using mobile phones (Dobo, 2021). A student's mobile phone would not have free access to applications and subscription services that are provided by a school-issued device, possibly limiting the work a student could have done on their mobile phone. Many school-issued devices are also limited in what social applications and games students can download, limiting their distractions (Dobo, 2021). A teacher believing that students should have had ample venues to access the internet, and simply chose not to, may have resulted in teachers viewing students as

lazy or irresponsible. This in turn may explain why "a lack of student discipline" had one of the highest total mean scores (4.63) of any response dealing with poor student performance during e-learning.

Ancillary quantitative analysis conducted with ANOVA on the variable of experience instead of income yielded two statistically significant results. The first showed that less experienced teachers, those with 1-5 years of experience, were significantly less likely to view their own lack of a device as a hindering factor to conducting effective e-learning than those with 11-16 years of experience. The district the study was conducted in provides all employees with a laptop computer and tablet. Total mean scores (M=1.95) for this item were low and expected to be equally low across all levels of experience. Open-ended responses in the 11-16 years of experience demographic did not clarify or explain why this group had significantly less access to devices than those with 1-5 years of experience. A possible explanation may be that those with less experience were issued newer devices and were less likely to encounter technical issues or that those in the 1-5 years of experience group are on average younger and more apt to embrace new technology. Based on the results from the 11-16 group, one might expect those with even more experience to have more issues with their devices, which is not supported by the data from those with 17 or more years of experience. Another possible explanation is teachers within that demographic may be referring to devices within their classroom that they did not have access to at home during the pandemic. For example, overhead projectors, Swivl, lab equipment, or other non-computer devices that are common in a classroom but not in one's home. Teachers with less experience may have had less time to acquire those devices or their teaching styles may not have demanded them.

The second statistically significant ancillary result discovered through quantitative analysis was again on survey item 14b, concerning the belief that a lack of student devices negatively impacted students during e-learning. In addition to having significant differences based on low-income vs. high-income schools, significant differences were discovered based on years of experience. Teachers with 1-5 years of experience were more likely to agree that a lack of devices was negatively impacting students than the 11-16 years of experience group. It is difficult to attribute more experience as a possible explanation to the difference as the 17+ experience group did not differ significantly from the 1-3 or 4-5 group. Those in the 11-16 group were nearly equally from low- and high-income schools and were not imbalanced compared to other groups on any other attribute collected by the study. A possible explanation is that those with less experience may have more recent professional development, coaching, and coursework involving technology causing them to see it as more essential. For example, the district where the study was conducted requires teachers with less than six years of experience to have more frequent observations, peer mentoring, and academic coaching. This in turn may make them keenly aware of which students do not have access to technology and the negative impact a lack of a device has on a student. Lastly, teachers with less experience typically teach lower-level classes that are more likely to be populated by low-income students (Fensterwald, 2018). This may have also contributed to the difference in perceptions among the groups.

Qualitative analysis on open-ended questions revealed differences between the responses of both groups. Among the most notable were teachers at low-income schools were more likely to mention positive changes to their view of technology while teachers in high-income schools were more likely to have a negative change. The researcher is unaware of any previous research that supports the findings of this aspect of the study as there has never been a mass shift to e-

learning due to a pandemic. Although, research does suggest that low-income schools are less likely to have in-depth professional development surrounding technology and are less likely to implement it (Blanchard et al., 2016; Li et al., 2019). Perhaps the influx of professional development and the drastic increase in the need for technology exposed more low-income teachers to the benefits of technology-enhanced learning. It may also be the case the e-learning cut many high-income teachers off from the resources they were used to enjoying at their school. High-income schools typically have more resources than low-income schools and the loss of those resources had more of an impact on the perception of teachers at high-income schools (National Center for Education Statistics, 2018a).

Another interesting finding among qualitative data was the number of low-income teachers that wrote responses indicating their increased awareness of the impact of socio-economic status in student performance. A respondent wrote "I saw one of my students who hadn't completed any work working in the grocery during the pandemic. I wanted to lay into him, but I realized what if his parents had been laid off and he had to have this job? Would quadratic equations matter to him right now?" It appears among some teachers that the pandemic has made them more aware of student trauma and the negative impact it has on learning. Teachers' open-ended responses implied an understanding that the pandemic itself was a traumatic event by agreement with the statement "I believe hardships caused by the virus and resulting shutdowns contributed to the shortcoming of students who performed poorly in e-learning" was not overwhelming or significantly different between income groups (M=3.78).

Qualitative data showed a difference in how teachers at low-income schools and high-income schools viewed administrator support during the pandemic. Teachers at low-income schools were more likely to cite a lack of administrative support as a factor that hindered their

ability to effectively conduct e-learning. Conversely, teachers at high-income schools were more likely to write about their administration contributing to their ability to effectively conduct e-learning. Research does suggest that low-income schools are more likely to be staffed with inexperienced or ineffective teachers and administrators when compared to high-income schools (Fensterwald, 2018). Low-income schools typically need more support from administrators and during this time of high need may have felt that they were getting the support required contributing to a negative perception A possible explanation for this difference may also reside in what teachers expect from their administration. The data from this study suggested that teachers at high-income schools were slightly more likely to view the professional development given by the county both before and after the pandemic in a positive way than compared to teachers at low-income schools. This may have contributed to them feeling as if the administration had supported them. It could be that respondents were not differentiating between administration in their schools, such as principals, and administration at the district level, such as the superintendent of schools.

An unexpected finding in the qualitative data was teachers at high-income schools being more likely to write about a lack of access to the internet as a hindrance to conducting e-learning. Research suggests that high-income schools would have fewer students who lack access (HUD, 2016; National Center for Education Statistics, 2018b). An analysis of open-ended responses showed that in some cases teachers at high income-schools were referring to the crashing of learning management systems for extended periods during class hours, not necessarily their students lacking access to the internet at home. Another unexpected finding was that the data seemed to show a difference in the level of confidence among teachers at high-income schools compared to those at low-income schools. Though teachers at low-income schools were more

likely to attribute high-quality teachers to effectively conducting e-learning, teachers at high-income schools were more likely to attribute effective e-learning to their own personal skill and no teachers in high-income schools suggested teacher inexperience to be a factor in poor student performance during e-learning.

While analysis did reveal differences between high- and low-income schools, perceptions surrounding e-learning during COVID-19 produced many similarities that suggest a high level of homogeneity between teachers. Both low- and high-income respondents had items in which they strongly agreed or disagreed with equal or near-equal mean scores, far more than the items in which there was a statistically significant difference between the two groups. Teachers, on average, agreed (M=4.65) that a lack of support at home was a factor in poor student performance during e-learning. The means on this survey item, for both teachers at low-income schools and high-income schools, were equal, resulting in a t-score of 0. This high level of agreement between the groups is supported by qualitative open-ended responses. When asked what other factors may have led to poor student performance 35% of all respondents for that question wrote a response around the concept of lack of parental support. Conversely, when asked what other factors may have contributed to student success during e-learning in an open-ended question, 45% of respondents for the question wrote a response mentioning parent involvement. Teachers, on average, also agreed (M=4.25) that parent involvement was a factor in student success during e-learning. Due to the relative infancy of research surrounding the impact of e-learning due to COVID-19 at the time of this study, the researcher is unaware of any related study that may support or undermine these findings.

Parental support has long been established as a contributing factor to student success in traditional face-to-face instruction and it can be assumed that this would be true in an e-learning

setting as well (Chohan et al., 2010). One respondent wrote, "e-learning seems to have undermined our discipline structure and relationship building that we rely on to ensure students are participating." In the same vein of thought another wrote "if a parent isn't there making sure their child is logging on and staying up with the class, I'd say they had no chance to pass." In a face-face setting, teachers can make themselves personally responsible for a student's engagement with material and has methods, like interpersonal skills as well as discipline referrals, to compel students to complete tasks. E-learning due to COVID-19 seemed to shift that responsibility back to parents who were now, in their own way, responsible for maintaining the classroom (Garcia & Weiss, 2020). The findings of this study support the notion that teachers, regardless of the income level of their school, saw parental support as essential to student success during e-learning.

Teachers from both low- and high-income schools, on average, agreed (M=4.63) that a lack of student discipline was a factor in poor student performance during e-learning. Research suggests that e-learning does require a higher degree of self-discipline (Hodges, et al., 2020). This may have contributed to that perception. Additionally, with the data that suggest teachers believe students needed parental support to succeed in mind, it is not surprising that a lack of self-discipline, which teachers may assume can be corrected by parental support, is also believed to be a factor contributing to poor performance during e-learning.

Further similarities were discovered concerning internet access. Teachers from both low- and high-income schools, on average agreed, (M=4.10) that a factor that contributed to poor student performance during e-learning due to COVID-19 was a student's lack of access to the internet. Previous studies have shown that rural areas and low-income districts like the one featured in this study often have connectivity issues and struggle with remote learning (National

Center for Education Statistics, 2018b). Based on open-ended responses collected in the survey, it appears teachers from both low- and high-income schools encountered issues with internet connection. Some teachers referred to the frequent crashing of their learning management system while others mentioned that their students simply did not have paid access to the internet from home. Teachers did not seem to overwhelmingly agree (M=3.60) that school-provided hotspots and internet access points contributed to student success during e-learning and resolved the issue of internet access.

Similarities between the groups were also discovered on the topic of school-issued devices for students. Teachers, on average, agreed (M=4.17) that devices given to students were a factor in student success during e-learning. At first glance, one might expect high levels of agreement from teachers given that devices are critical to e-learning and having a school district provide them to children logically seems to contribute to student success. An explanation for less-than-expected agreement may be that some teachers believed that their students were relying on their own devices to complete coursework. Another possible explanation may be that teachers did not believe that school-issued devices were enough to overcome other issues that negatively impacted student performance and therefore, scored this item lower. For example, one respondent wrote the following about devices: “It doesn’t matter that they have iPads, there is no accountability. Just because they have the tools to do work doesn’t mean they are going to do it if they don’t feel like they have to.” Accountability was a common concern among the teachers in other areas of the survey as well. Responses to the survey item regarding the WVDE decision to freeze grading during the pandemic were unsurprisingly mixed among teachers (M=2.56). Open-ended responses revealed that some teachers saw the grading freeze as the main cause of the diminished student participation they witnessed in their classes. Other respondents indicated

that the grading freeze was necessary to protect those students who may not have access to the internet at home from being unfairly punished. Accountability was also discussed by teachers in the open-ended question regarding factors that hindered their ability to conduct e-learning. In all, 36% of respondents to that question cited poor student participation as a hindering factor. A respondent said "the State Department took away all incentive for students to work so long as they were doing ok before the pandemic. That decision tanked all of my AP classes. It showed students that grades matter, not learning.". Teachers believed student participation was lacking and that a loss in accountability was a source of that issue.

The last noticeable similarities were discovered in teacher perceptions of their classroom. Teachers from low-income schools and high-income schools, on average, agreed (M=4.30) that they had altered their classroom rules and expectations during e-learning due to COVID-19. This result was excepted because, as discussed in the literature review, e-learning makes many concepts that are essential to face-to-face learning obsolete. Recommended e-learning pedagogy demands that the course functions fundamentally different than an in-person course (Hodges, et al., 2020; Panigrahi et al., 2018; Zheng et al., 2020). Professional development distributed by the district asked teachers to remain flexible in their attendance and grading policies to accommodate the drastic shift in content delivery (WVDE, 2020). In open-ended responses, 45% of all respondents to the question concerning changes to their classroom expectations during e-learning indicated adopting more flexible grading policies. It is clear from open-ended responses to this question that some teachers refused to change any other classroom policies. One respondent indicated that "I didn't change any policies. Our school believes in high expectations, no excuses. When we expect less, we get less." Responses like these were in the minority.

Lastly, teachers from both income levels, on average, agreed (M=4.13) that separation from their classroom was harming their students. This finding is supported by research that suggests teachers believe e-learning due to COVID-19 broke down necessarily relationships between schools and their students (Kim & Asbury, 2020). While this result was suspected, agreement on this item was expected to be higher. Nearly every state within the U.S. has made a return to in-person a priority for the 2021-2022 school year (CDC, 2021). The school district in which the study was performed announced that it intends to return to class in the Fall of 2021, maskless and with no COVID-related modifications. The West Virginia Department of Education, on multiple occasions, has reported the ineffectiveness of e-learning (WVDE, 2021). Other studies also discuss how emergency remote e-learning might have negative consequences for students (Reich et al., 2020). It may be that teachers are not prioritizing a return to the classroom in the same way administration is. Perhaps teachers out of concern for their safety, belief in their own effectiveness as e-learning teachers, or some other factors may have contributed to a lower-than-expected score.

RECOMMENDATIONS FOR FURTHER RESEARCH

This study investigated and provided insight on teacher perceptions of e-learning due to COVID-19 and sought to discover if there were meaningful differences in experiences between teachers at high-income schools and low-income schools. The study focused on how teacher perception of technology may have changed, which factors contributed to or hindered effectively conducting e-learning, teacher experiences during e-learning, and lastly, how teachers believe e-learning impacted their students during the COVID-19 pandemic. Based on the findings of this study, the following recommendation for further research are provided:

1. This study focused on teachers within the same county in a sparsely populated state. Expanding this study to include larger and more diverse school districts might provide supporting data to this study's conclusions and implications as well as discover new perspectives unique to that specific area. An expansion of this study might also be able to increase its scope of variables and discover meaningful differences between teachers at urban, rural, and suburban schools or schools with small vs. large student bodies.
2. This study focused on the opinions and perceptions of teachers concerning e-learning due to COVID-19. Those opinions and perceptions often involved school and county-level administration. It may be beneficial to collect the opinions of administrators and compare them to that of their staff to see where discrepancies lie between policy creators and policy implementers. Such a study may explain why some teachers cited a lack of administrator support during e-learning and why others listed administrator support as a factor that contributed to e-learning's success.
3. This study focused on the opinions and perceptions of teachers. Those opinions and perceptions often involved the living conditions, attitudes, and performance of students they taught. Though data collection may prove difficult because of necessary protections surrounding the research of children, it may be beneficial to collect the perceptions of students and how they believe e-learning impacted their lives. Their insight into what made e-learning intolerable, enjoyable, challenging, or otherwise may be the most important source of data to discovering factors that

contributed to e-learning's success or failure and what factors in students predicted high or low performance during e-learning.

4. This study focused on the opinions and perceptions of teachers. Those opinions and perceptions often involved the parents of their students and how much support they gave their child during e-learning due to COVID-19. It may be beneficial to conduct a study that captures the opinions and perceptions of parents concerning teachers, their child's performance, and administration. This may provide data to support the conclusions and implications of this study but also provide insight into the difficulties of parenting a school-aged child in the middle of a global pandemic.
5. Findings from this study indicated a statistically significant difference in teachers at high- and low-income schools concerning student-issued devices. A study that focuses on high- and low-income schools without 1:1 device programs and compares student performance during e-learning due to COVID-19 may provide beneficial insight into the need for such programs. This study could also collect opinions on the effectiveness of alternative policies that helped students connect to the internet without school-issued devices during e-learning.
6. While this study focused on teacher perceptions of e-learning and the analysis thereof, it may not go far enough into capturing the current and future impact of e-learning due to COVID-19 on students across all grade levels and incomes. A quantitative study focusing on student performance data in a large sample may better quantify and discover just what kind of impact e-learning had on student learning, who was impacted the most, and what were the consequences of that

impact. A study of this nature may also be used to predict the impact this time of emergency e-learning might have on phenomena like the achievement gap, readiness for higher education, school to prison pipeline, and other performance inequalities in American education.

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APPENDICIES

APPENDIX A: IRB APPROVAL

Anna Robinson <no-reply@irbnet.org>
Thu 4/8/2021 1:50 PM

To: McFall, Kimberly; Cooper, Thomas A
Message from Anna Robinson:

Re: [1691290-1] Teacher Perceptions of E-Learning due to COVID-19 in Low- and High-Income Schools

In accordance with 45CFR46.104(d)(2), the above study was granted Exempted approval today by the Marshall University Institutional Review Board #2 (Social/Behavioral) Designee. No further submission (or closure) is required for an Exempt study unless there is an amendment to the study. All amendments must be submitted and approved by the IRB Chair/Designee.

Regards,
Anna Robinson

APPENDIX B: SURVEY CONSENT

Dear Educator,

You are invited to participate in a research project entitled "Teacher Perceptions of E-Learning due to COVID-19" designed to analyze teacher's experiences with e-learning during the COVID-19 pandemic. The study is being conducted by Dr. Kimberly McFall from Marshall University and has been approved by the Marshall University Institutional Review Board (IRB). This research is being conducted as part of a doctoral dissertation at Marshall University for Thomas Cooper.

The survey is comprised of a Google form questionnaire which will take approximately ten (10) minutes to complete. Your replies will be anonymous, so do not type your name anywhere on the form. There are no known risks involved with this study. Participation is completely voluntary and there will be no penalty or loss of benefits if you choose to not participate in this research study or to withdraw. If you choose not to participate you can leave the survey site. You may choose to not answer any question by simply leaving it blank. Once you complete the survey you can delete your browsing history for added security. Completing the on-line survey indicates your consent for use of the answers you supply. If you have any questions about the study, you may contact Dr. Kimberly McFall at (304) 746-8975 or Thomas Cooper at cooper321@marshall.edu (304) 881-9638).

If you have questions about your rights participating in this research, contact the Marshall University Office of Research Integrity at (304) 696-4303.

By completing this survey, you are also confirming that you are 18 years of age or older.

Please print this page for your records.

APPENDIX C: SURVEY INSTRUMENT

Teacher Perceptions of E-learning During COVID-19

1. In which school do you primarily teach?

   Mark only one oval.

   - [redacted] Elementary School
   - [redacted] Elementary School
   - [redacted] Middle School
   - [redacted] Middle School
   - [redacted] High School
   - [redacted] High School
   - [redacted] Middle School

2. Years of Experience in Teaching (including this year)

   Mark only one oval.

   - 1st Year
   - 2-3
   - 4-5
   - 6-10
   - 11-16
   - 17+

3. Primary Subject Area Taught

Mark only one oval.

- ◯ Business / Computers
- ◯ Career and Technical
- ◯ Elementary (self-contained)
- ◯ English/ Language Arts
- ◯ Fine Arts
- ◯ Foreign Language
- ◯ JROTC
- ◯ Mathematics
- ◯ Music Education
- ◯ Physical Education / Health
- ◯ Science
- ◯ Social Studies
- ◯ Special Education
- ◯ Other

4. Please respond to the following prompts.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
"I use technology more in my face-to-face classes because of experience with e-learning." (skip if you do not teach face-to-face classes)					
"I see more potential for technology in education because of e-learning."					
"I have more expertise using technology driven strategies in the classroom due to the e-learning."					

5. In what ways, if any, did e-learning due to Covid-19 shift your view of technology's role in education?

6. Please respond to the following prompts.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
"I believe Schoology Conference and other recording programs like Zoom contributed to my ability to effectively conduct e-learning"	◯	◯	◯	◯	◯
"I believe technology based professional development provided by leadership BEFORE e-learning due to COVID-19 contributed to my ability to effectively conduct e-learning"	◯	◯	◯	◯	◯
"I believe technology based professional development provided by leadership DURING e-learning due to COVID-19 contributed to my ability to effectively conduct e-learning"	◯	◯	◯	◯	◯

7. Please describe any other factors that you believe contributed to your ability to effectively conduct e-learning during COVID-19.

8. Please respond to the following prompts.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
"I feel a lack of e-learning centered professional development challenged my ability to conduct an effective e-learning class"					
"I feel that the sudden nature of the transition to e-learning challenged my ability to conduct an effective e-learning class"					
"I feel the frequency of technical issues challenged my ability to conduct an effective e-learning class"					
"My lack of a device or internet access challenged my ability to conduct an effective e-learning class"					

9. Please describe any other factors that you believe hindered your ability to conduct an effective e-learning class.

10. Please respond to the following prompts.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
"I believe e-learning should continue to have some role in the K-12 environment."					
"I amended my classroom policies on late work and grading to be more accommodating for struggling students during e-learnig due to COVID-19."					
"I believe disallowing grades to drop below their pre-pandemic level was an appropriate policy decision during e-learning in the Spring Semester of 2020"					
"I believe some students found more success in an e-learning setting than a traditional in-person setting."					
"I believe separation from a traditional in-person classroom setting negatively impacted students."					

11. Did your classroom expectations change during the switch to e-learning, if so how?

12. Please respond to the following prompts.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
"I believe school-issued iPads contributed to the success of students who performed well in e-learning"					
"I believe buses and school provided hotspots contributed to the success of students who performed well in e-learning"					
"I believe support from parents and other resources at home contributed to the success of students who performed well in e-learning"					
" I believe students' previous experience with e-learning classes contributed to the success of students who performed well in e-learning"					

13. Please comment on any other factors or circumstances that you believe might be attributed to students who performed well in e-learning.

14. Please respond to the following prompts.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
"I believe a lack of internet access at home contributed to the shortcoming of students who performed poorly in e-learning"					
"I believe a lack of devices contributed to the shortcoming of students who performed poorly in e-learning"					
"I believe hardships caused by the virus and resulting shutdowns contributed to the shortcoming of students who performed poorly in e-learning"					
"I believe a lack of support from home contributed to the shortcoming of students who performed poorly in e-learning"					
"I believe a lack of discipline for self-directed learning contributed to the shortcoming of students who performed poorly in e-learning"					

15. Please comment on any other factors or circumstances that you believe might be attributed to students who underperformed in e-learning.

APPENDIX D: VITA

Thomas Cooper

160 Clifton Ave Pratt, WV 25162.
Phone: 304-881-9638 Email: tcooperresearch@gmail.com

EDUCATION

B.A., History, 2012, West Virginia University
M.A., Secondary Education with Certification in Social Studies, 2015, West Virginia University
Candidacy in Ed.D. of Curriculum and Instruction, 2018-Current, Marshall University
Dissertation: Teacher Perceptions of e-learning During COVID-19 in Low- and High-Income Schools**,** 2021

ACADEMIC ACHIEVEMENTS

- Current Doctoral Candidate at Marshall University
- Graduated Summa Cum Laude from Eberly College of Arts and Science. WVU
- Recipient of the WV Promise Scholarship
- Completed two IRB reviewed studies on the impact of interventions for low-income students

PROFESSIONAL EXPERIENCE

West Virginia State University - Adjunct Professor: December 2017- Currently

- Teaching Philosophy 201/202: created and sourced textbook for a hybrid course, intro to critical reasoning and philosophy of the western world. (Dual Credit Course)

Kanawha County Schools -Teacher: June 2015- Currently

- History Department Head
- Member of the Professional Development Team
- Presented CSI data as a representative for the school
- Researched and reported to staff the strengths of Standards-based grading
- Researched and reported to staff the effectiveness of a “No Zero Policy”
- Researched and reported to staff the merits of the LMS “Schoology’
- Designed a self-regulating database of all students failing a core class

SCHOLARLY ACTIVITIES

Cooper, T. (2019). Effectiveness of the S.O.S Student Intervention Program in Rural Schools. *Marshall University*

Cooper T. (2020). Plato and the Spinoza: The Duty of the Teacher and the Mindset to Perform it. *Marshall University*