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Examining Digital Proficiency Perceptions and Differences in Achievement During the Covid-19 Pandemic in a Rural Mid-Western High School

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In partial fulfillment of the requirements for the

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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this world. Your dad and I are so proud of you. You will always be our superhero. We love you.

Abstract

In response to the Covid-19 Pandemic, schools worldwide were forced to react quickly to meet the needs of all students in an unprecedented time of change for all facets of society. Through a mixed-method approach, this study aimed to explore the effect of hybrid learning on student achievement, as well as the effect, if any, of teachers' perceptions of their own digital abilities on student achievement. The research also examined the thoughts of students and teachers as it pertained to teaching and learning during the global pandemic. To analyze the effect of hybrid learning on student achievement, the researcher compared English II and Government End-of-Course (EOC) scores from a year when traditional instruction took place versus a year that required hybrid instruction due to the pandemic. A representation of teachers and students completed surveys, both based on the ISTE Standards, which focused on the respective perceptions of the teachers' digital abilities. Teachers also completed a survey that analyzed three areas of their relationship with technology use: Comfort and Confidence, Perception of Technology Use, and Technology Integration. Those survey results were tied to EOC scores, which revealed the correlation between perception and achievement. Finally, students and teachers were given an opportunity to share their thoughts concerning the challenges of teaching and learning during a pandemic by answering open-ended questions housed in *Qualtrics*. The intent of this study was to provide the story of a small rural school as it navigated its way through a challenging time in the world. This study also serves as a guide to comparable districts as they begin their 1:1 journey and in a time of crisis.

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Chapter One: Introduction

Education leaders faced unprecedented times during the global Covid-19 Pandemic, which had an extremely negative effect on classrooms across the globe (as cited in Ogodo et al., 2020; Engzell et al., 2020; Mohan et al., 2020; Obiakor & Adeniran, 2020; Kuhfield et al., 2020; Azevedo et al., 2020; Darling – Hammond, 2020; Dorn et al., 2020). Ogodo et al.'s (2020) research found that many teachers had the digital competency for classroom instruction, however they were unable to engage effectively with their students, due to insufficient training for online instruction and limited digital tools and resources at teachers' level of digital competency that correlated with their self-efficacy (para. 1, p. 13) Ogodo et al. discussed how research indicated that the Pandemic exposed the existing digital divide and unequal distribution of resources and noted the importance of examining teacher self-efficacy in online education, as recent research revealed a link between teacher self-efficacy and the use of technology in the classroom (Corry & Stella, 2018; Dolighan & Owen; Ogodo et al., 2021, p. 13). Ogden et al. (2021) also discussed how the COVID-19 Pandemic likely impeded pupils' academic development in American K12 settings (as cited in Ogodo et al., 2021; Cottingham et al., 2020; Dorn et al., 2020).

The emergency switch to virtual learning left school districts unprepared, resulting in unstructured formats where mandates placed teachers and students in new learning settings with sporadic communication, which may have contributed to learning loss (Azevedo et al., 2020; Darling-Hammond & Hyler, 2020; Malkus et al., 2020). In certain circumstances, school administration issued contradictory orders resulting in learning loss (Ogodo et al., 2021, p. 13).

As cited in Ogodo et al. (2021, p. 15), the researched data collected concerning Covid-19 and education suggested that the impacts of the global Covid-19 Pandemic widened the educational gap that had existed for years, suggesting that the American education system was in a position where it could deeply and effectively reflect upon meaningful changes needed for our students (Cottingham et al., 2020; Engzell et al., 2020; U.S. Department of Education, 2021). In reviewing the literature on teacher self-efficacy in online education, Corry and Stella (2018) also indicated that researchers agree that online and face-to-face education have different contexts and warrant examining teacher self-efficacy.

Chapter One includes an introduction of the study background, rationale, and conceptual framework. Next, the purpose of the study was explained which led to the research questions and hypothesis, followed by the research methodology including the qualitative and quantitative research design. Then, the study population were described, key terms were defined, and the study delimitations, limitations, and assumptions were described.

Background of the Study

Research by Francom et al. (2021) recently stated that K-12 schools in the United States shuttered, due to the results of the unprecedented COVID-19 outbreak, and education leaders asked teachers to move their classes online. Unfortunately, many teachers felt unprepared for this change and experienced significant difficulties providing high-quality instruction in an online environment. The global pandemic provided opportunities for teachers and administrators to assess their schools' readiness for

distance education and improve their preparedness for future emergency circumstances (Francom et al., 2021).

According to Thomas and Rogers (2020), however, the required changes that imposed reliance on technology in education might hasten current reforms already in place. Furthermore, according to Thomas and Rogers (2020), the epidemic might prompt educators to reconsider present teaching paradigms by quickly determining which educational technologies yielded successful outcomes. Granted, early versions of home education resembled typical teacher-led classrooms, where teachers assigned homework that required websites and online tuition for specific courses, such as spelling or arithmetic (Thomas & Rogers, 2020). However, Thomas and Rogers (2020) indicated that an early technology-driven educational revolution appeared as teachers functioning as curators for virtual learning settings that students can explore alongside their classmates to solve challenges (Thomas & Rogers, 2020).

According to Kaware and Sain (2015), teaching learners in a world that could gain instantaneous information was a challenge for educators. As stated by Considene et al. (2009), millennials, born between 1982 and 2002, grew up in a world where technology was embedded in learning and felt comfortable with learning this way. However, when millennials entered public schools, the schools may have lacked the ability to take advantage of the new literacy abilities that were now a part of the student learning approach (Considine et al., 2009). Considine et al. (2009) stated that technology changed how information reached the learner, which introduced issues, such as determining whether or not teachers used technology effectively to reach the students. Many public schools scrambled to implement this desperate need for technology

integration into instruction when the pandemic hit (Francom et al., 2021). According to Dede (2007), high schools were still subject to the historical learning methods that limited students' ability to utilize new methods and technologies. Anderson (2018) stated that many educators wondered how to embrace technology to benefit their students. While some educators already utilized instructional technology, many rural schools had minimal exposure to technology and grappled with effectively obtaining and using new technologies. Educators had limited professional development on integrating new technologies, due to time constraints (Anderson, 2018). As a result, new technologies produced the *digital divide* (Anderson, 2018). Additionally, Anderson (2018) stated that 15% of school-age children did not have access to the internet, which forced schools to come up with answers to closing the digital divide gap (para. 1). Davies (2013) stated that secondary goals of federal education legislation included that every student becomes technologically literate and that education leaders encourage teachers to integrate technology into their instruction effectively.

Education leaders referred to teachers' beliefs and confidence about their ability to effectively deliver quality instruction to students as *teacher efficacy* (Hatlevik, 2017). Klassen and Chiy (2010) claimed that efficacy plays a considerable role in successful instruction and learning because of correlations to teachers' behaviors and choices during lessons. Hattie (2008) stated that teacher efficacy is the number one influence related to student achievement. Additionally, Tschannen-Moran and Johnson (2011) asserted that teacher efficacy beliefs affect teacher motivation and student learning. According to Hatlevick's (2017) research, teacher efficacy plays a crucial role in digital proficiency. To develop digital proficiency, teachers need to fulfill two requirements: have the ability

to deliver the technology goals to the students outlined in the curriculum and use technology in their instruction to meet technology integration goals (Hatlevick, 2017). Research reveals those teachers with low technology efficacy use technology the least in instruction (Hatlevick, 2017).

As Meason (2020) explained, the Covid-19 Pandemic spread across the country, K-12 and higher education institutions made significant modifications to rules and instructional practices to protect students, employees, and their families' health and safety, while also providing all students quality education. Educators' concerns included maintaining safety, while having people in school supporting students that do not feel safe stepping foot in a public-school building, maintaining effective online learning, and possibly learning within a hybrid setting (Knips, 2020). In addition, various Covid-19 global pandemic concerns had educators asking questions on equity issues relating to devices, internet access, and parental support (Knips, 2020). Based on research by the College of Dupage (n.d.), schools worldwide answered those questions with various solutions. The answer for the study school in this research was *hybrid learning*. *Hybrid learning* is an instructional approach that combines face-to-face and online learning into one model (College of DuPage, n.d.). Some advantages of *hybrid learning* include flexibility of when learning takes place, the delivery approach of instruction, and opportunities for students to display learning (College of Dupage, n.d.).

Rationale

Based on information from a 2020 interview conducted by Jill Anderson of Harvard Graduate School of Education, we do not hear much about the 15% of students who go to rural schools. National discussions did not often include the rural community

regarding COVID's impact on schooling (Anderson, 2020). Most published research was minimal during this study, as educators worldwide were still amid the Covid-19 Pandemic, limiting information on how technology integration during hybrid learning affected achievement in small rural and impoverished areas. Therefore, leaders from comparable districts could learn from this study as they move forward with implementing technology integration and non-traditional instructional approaches using a hybrid learning environment. Education leaders and researchers who choose to use this study as a guide could notice information broken down into specific categories of possible factors that might affect student achievement during a time of non-traditional instruction, such as hybrid-teaching. This study might also reveal the next steps for students and teachers as Covid-19 continues to affect our schools by guiding teachers and students in a qualitative aspect.

Conceptual Framework

Redmond (2016) claimed *self-efficacy* is a concept developed by Bandura, a Canadian psychologist. Additionally, the theory of *self-efficacy* is a part of a much larger theory, the theory of *social-learning* (Redmond, 2016). Bandura explained the importance of self-efficacy:

> People make causal contributions to their own psychosocial functioning through mechanisms of personal agency. Among the mechanisms of agency, none is more central or pervasive than beliefs of personal efficacy. Unless people believe they can produce desired effects by their actions, they have little incentive to act. Efficacy belief, therefore, is a major basis of action. People guide their lives by their beliefs of personal efficacy. (as cited in Artino, 2012, p. 77)

Bandura (1998) defined *self-efficacy* as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (p. 71). However, there are two aspects of the definition of self-efficacy that require further explanation. First, while self-efficacy centers on the belief about one's capability, it does not necessarily match that individual's actual capabilities. Nevertheless, as Bandura (1998) believed, the self-efficacy theory suggests that having extreme belief in oneself can increase the efforts someone puts into tasks or challenges. Second, the theory also states that people tend to connect their efficacy judgments to a specific goal (Bandura, 1998).

The theory of self-efficacy is not without its criticisms. For example, Eastman and Marzillier (1984) identified three issues with Bandura's theory of self-efficacy. The first problem was the vagueness of Bandura's definition. The second was a lack of evidence of the relationship between research findings and self-efficacy. The final issue Eastman and Marzillier (1984) unveiled suggested that the research did not sufficiently evaluate Bandura's claims, and therefore more research was needed on the theory.

In Bandura's 1994 report on self-efficacy, he explained how self-efficacy affects people. Additionally, self-efficacy determines how individuals think, feel, motivate themselves, and behave. A high sense of self-efficacy can increase accomplishments and a person's overall well-being. Individuals with a strong sense of *self-efficacy* approach complex tasks as challenges, instead of threats. Furthermore, a deep sense of efficacy instills intrinsic interests and a deep dedication to personal interests and activities. People motivated by self-efficacy set challenging goals and remain committed to completing those goals. For these individuals, failure, which they view as a lack of an ample amount

of effort or the absence of knowledge to reach a goal, is not an option. On the other hand, individuals with a lower sense of self-efficacy tend to doubt their abilities and therefore shy away from challenging tasks. The commitment level is low, and these individuals continue to dwell on their deficiencies, resulting in giving up quickly.

Bandura (1994) identified four main sources of self-efficacy. First, Bandura stated that mastery experiences are the most effective way to create a strong sense of self-efficacy. Additionally, successes build up an individual's sense of efficacy, while failures knock that confidence down. Second, people can create self-efficacy through vicarious experiences. For example, seeing others who are similar to oneself or are in a similar situation experience success increases the belief that you too can encounter that same success due to the similarities. Social Persuasion is the third factor associated with increasing self-efficacy. Individuals who receive verbal praise are more likely to put forth more effort to reach a goal. Finally, Bandura (1994) stated that one's emotional state and reducing stress plays a prominent role in creating self-efficacy. For example, high-stress levels can be self-perceived as weakness or vulnerability, whereas hard work and positive moods enhance a sense of self-efficacy (Bandura, 1994).

A significant amount of Bandura's (1994) research focuses on how precisely self-efficacy affects human functioning. According to Bandura (1994), there are four main psychological processes in place that affect functioning. The first process, cognitive processes, includes personal goal setting. The more robust sense of self-efficacy one possesses, the higher the goals. Secondly, self-efficacy also affects self-motivation. Human beings create theories of what they believe they are capable of accomplishing. Those with high self-efficacy envision themselves experiencing positive outcomes, while

those with low self-efficacy tend to picture the worst possible outcome. Self-efficacy affects the goals individuals set for themselves, the amount of effort they put into reaching those goals, the length of perseverance, and resiliency in the face of adversity. Third, self-efficacy also plays a vital role in handling stress. For example, individuals with a higher sense of self-efficacy believe that they can manage their stressors and tend to think positively, avoiding depression, while those with a low sense of self-efficacy allow negative thoughts to take over, resulting in an impairment of thought and function, which can result in depression. Finally, self-efficacy has the power to shape the course of lives by playing a role in the activities and environments that individuals choose for themselves. Individuals' choices nurture their abilities, interests, and friendships (Bandura, 1994). According to Bandura (1982), self-efficacy affects employees as both learners and performers in the following ways:

- Self-efficacy affects the goals that employees choose. For example, employees with low levels of self-efficacy are more likely to set lower goals for themselves than employees with higher self-efficacy.
- Self-efficacy impacts learning as well as the effort that employees exert on the job. For instance, when an employee has high self-efficacy, they are more likely to work harder to learn a new task due to the higher level of confidence in their abilities than an employee with low self-efficacy.
- Self-efficacy will influence the persistence for which a person will attempt to learn a new and difficult task. Employees who are high in self-efficacy are thought to be more confident and therefore will persist in their efforts when learning a new task even when encountering a problem. (p. 126)

Based on Redmond's (2016) research, the theory of self-efficacy applies to the workplace. Redmond suggested that increasing self-efficacy in employees increases motivation and productivity. Redmond (2016) also asserted that when people believe they are capable, then performance levels increase.

Statement of the Problem

Rural schools dealt with a phrase labeled as the *digital divide* (Anderson, 2018). While 15% of school-age children did have access to the internet, mandates forced schools to find solutions to close the digital divide gap (Anderson, 2018, para. 1). Davies (2013) stated that secondary education goals of federal education legislation included that every student should become technologically literate and that school leaders should encourage leaders to successfully train teachers to integrate technology into their instruction.

Overarching Focus

The current literature primarily focused on the common core areas of English II (ELA) and Math, as did the foci of the research study. The research site data collection included prior knowledge from a dual role, including Researcher and Coordinator of Secondary Teaching and Learning for the study site district. A deeper insight into participants' perceptions were considered background information, which helped determine that meaningful data were best collected from the ELA department as opposed to the math department, as most ELA department educators at the study school were confident with their technology abilities. Therefore, the following question was the primary study focus: How do we provide training that will make teachers feel comfortable and competent with technology integration?

Purpose of the Study

The purpose of this mixed-method study was to analyze how teacher digital proficiency affected student scores in grades 9 through 12 through the use of a hybrid instructional approach as a result of the global Covid-19 Pandemic. The quantitative portion of this study used the Technology Uses and Perception Survey (TUPS, 2020); the tool used to measure teacher perception of technology. This tool, which is a part of the Technology Integration Matrix (TIMS) Tool Suite (n.d.), informed the researcher of teachers' beliefs of the role of technology in the classroom, as well as their confidence and knowledge of digital proficiency. Teachers' perceptions of their own digital proficiency were analyzed by using an investigator-created perception survey, which was based off of the International Society for Technology in Education Standards (ISTE, 2020). The researcher also used a perception survey to study the students' perception of their teachers' knowledge of technology integration. The qualitative portion of this study used a *Qualtrics*-created survey with a select group (volunteers) of teachers and students to gain their perspective on what teaching and learning was like during a global pandemic. Although research has been completed concerning teacher digital proficiency, technology integration, and hybrid learning, very little of that research has focused on small rural schools in impoverished areas, and almost none of that research centered on the hybrid instructional approach during a pandemic, due to the fact that the pandemic is still active. Because there has been such little research conducted concerning the location and global pandemic aspects of this study, other comparable districts can learn from this study as they move forward with their own technology integration, including during a hybrid learning approach.

Research Questions and Hypotheses

There are two research questions and two hypotheses analyzed in this study, making this research a mixed-method research study. Two Research Questions focus on the thoughts of teachers and students during the 2019 Covid-19 global pandemic, and two hypotheses focus on how assessment outcomes are different based on perceptions of digital technology comfort and confidence, technology use, and technology Integration. Hypothesis 1 has three focus areas that examines three perception areas and the effects on achievement of two different High School End-of-Course (EOC) assessments in a rural Mid-western school district, while Hypothesis 2 compares differences in two different learning environments. Each research question and hypothesis is described as:

Research Question 1

What are teachers' and students' perceptions of the teachers' digital proficiencies?

Research Question 2

What are the thoughts of teachers and students as it pertains to the factors that affect student achievement during the Covid-19 Pandemic?

Hypothesis 1

There is a difference in students' Government and English II 2021 EOC scores based on the teachers' comfort and confidence levels with technology, perception of technology use, and level of technology integration.

Hypothesis 2

There is a difference between scores of students who had hybrid teaching and learning those who did not.

Research Methodology

The purpose in developing a mixed-method study was to analyze how teachers' digital proficiency affected student achievement in grades 9 through 12 through a hybrid instructional approach, due to the global Covid-19 Pandemic. The analysis included quantitative data and qualitative data concerning student achievement, which analyzed feelings of teachers and students as it pertained to the highs and lows of teaching and learning during a global pandemic. Using this mixed-method approach allowed the use of both data types, which often increases the overall strength of a study (Creswell, 2008). The mixed-method research design combined the strengths of both qualitative and quantitative approaches, while also making up for the weaknesses of each (Dawadi et al., 2021).

Additionally, the methodology incorporated knowledge acquired in a Likert-Scale survey (Boone & Boone, 2012) to determine a perception score to categorize quantitative data based on perceptions.

Research Design

This study addressed a very complex issue that investigated human thoughts and data represented by numbers, therefore the study used a mixed-method approach (Laverty, 2018). According to Dawadi et al. (2021), combining qualitative and quantitative research methods has the potential to allows for deeper insights into the research that would possibly be missed if only using one single approach.

Qualitative Design

The qualitative portion of this study utilized Data Collection Instruments 1 and 2, which allowed for secondary data analysis of study site data, which encompassed an

ISTE (2020) aligned questionnaire including seven teacher focused questions and eight student focused questions regarding their perceptions of teachers' technology use (see Appendix A and B). The analyzed qualitative data collected in Data Instruments 1 and 2 allowed an analysis that answered Research Question 1 and determined teachers' and students' perceptions of the teachers' digital proficiencies (see Appendix A and B).

Additionally, the qualitative portion of the study utilized Data Collection Instrument 3, contained two researcher-created questionnaires including 10 teacher-focused open-ended questions and 11 student-focused open-ended questions. Primary data were collected using a *Qualtrics* survey with a select group (volunteers) of teachers and students eliciting perspectives of teachers' digital proficiencies. Each questionnaire's questions focused on the participants' views of education during the Covid-19 global pandemic (see Appendix C). Finally, Data Collection Instrument 3 was created to analyze Research Question 2 which investigated differences in students' Government and English II 2021 EOC scores based on the teachers' comfort and confidence levels with technology, perception of technology use, and level of technology integration.

Quantitative Design

The quantitative portion of this study encompassed two hypotheses that analyzed students' EOC scores who attended the school study site in 2018 and 2021and were compared to evaluate differences between achievement in hybrid setting during the Covid-19 global pandemic and a non-hybrid setting during a non-pandemic time.

Data Collection Instrument 4, the Technology Uses and Perception Survey (TUPS, 2020), was used to pair students' 2021 EOC data with teachers' average perception outcome scores to evaluate differences within categories, or levels, teachers'

beliefs in their comfort and confidence levels with technology, technology use, and level of technology integration. The TUPS Data Collection Instrument 4 was a part of the TIMS Tool Suite (n.d.) and included questions which collected data on teachers' beliefs of the role of technology in the classroom, confidence levels of using technology, and knowledge of digital proficiency (see Appendix D).

Study Population

The study site was a high school in a rural town in southern Missouri. Teachers of varying experience levels and a sample of students were asked to participate in this study. Student representation came from a combination of grade levels from ELA and Government classes. The student population size was 1,125, and the sample size included 57 students whose EOC secondary data were analyzed. Additionally, 15 of the 57 students were asked to further their participation in the study by participating in a voluntary open-ended question survey and seven students responded to the survey. The teacher population was 85, six of whom were the sample size for secondary data. Fifteen teachers from the sample were given an opportunity to volunteer for the open-ended question portion of the study where nine teachers responded. The following information in Table 1 was gathered from the district's report card from MODESE (2021).

Table 1

Study School Demographics

Study School	2020-2021 School Year
TOTAL	2538
American Indian/Alaska Native	*
Asian	0.60%
Black	1.00%
Hawaiian Pacific Islander	*
Hispanic	3.50%
Multi-Race	2.40%
White	92.20%
Female	49.10%
Male	50.90%
Free and Reduced Lunch	58.8%
English Learner	0.75%
Special Education	14.74%
Homeless	2.44%
Migrant	*
Gifted	3.55%
Foster	0.79%
Military	0.43%

Definition of Key Terms

For the purposes of this study, the following terms are defined:

1:1 School - For the purpose of this study, a 1:1 school will be referred to as a school that has provided a device for each student.

21st Century Skills –

The term 21st century skills refer to a broad set of knowledge, skills, work habits, and character traits that are believed—by educators, school reformers, college professors, employers, and others—to be critically important to success in today's

> world, particularly in collegiate programs and contemporary careers and workplaces. (edglossary.org, para 1)

Asynchronous - Remote learning where students access lessons or independent learning tasks at any time during the day (Novato Unified School District, 2020).

Blended Learning - A formal education program in which a student learns in at least part through online learning with some element of student control over time, place, path, and/or pace and at least in part at a supervised brick-and-mortar location away from home. The modalities along each student's path in a course or subject are connected to provide an integrated learning experience (Horn & Staker, 2015).

Covid-19 Pandemic - Coronavirus is an infectious disease that is spread from person to person. The Covid-19 Pandemic forced schools across America to shut down in the spring of 2019.

Digital Learning - is any instructional practice that effectively uses technology to strengthen a student's learning experience. Digital learning encompasses a wide spectrum of tools and practices, including, among others, online and formative assessment; an increase in the focus and quality of teaching resources and time; online content and courses; applications of technology in the classroom and school building; adaptive software for students with special needs; learning platforms; participation in professional communities of practice; and access to high-level and challenging content and instruction (Office of Educational Technology, 2021).

Digital Proficiency - is the ability to understand and use technology effectively to increase student understanding and growth.

Equity in Education - Equity is achieved when all students receive the resources they need, so they graduate prepared for success after high school (Center for Public Education, 2016, p. 1).

Flipped Classroom - Is a course or subject in which students participate in online learning off-site in place of traditional homework and then attend the brick-and-mortar school for face-to-face, teacher-guided practice or projects. The primary delivery of content and instruction is online, which differentiates a Flipped Classroom from students who are merely doing homework practice online at night (Horn & Staker, 2015).

Hybrid Learning - is an instructional model that combines face-to-face and online teaching. In this model, half of the students are in the seated classroom while the other half is doing online learning at home (An Introduction to Hybrid Learning, n.d.)

ISTE Standards - The ISTE Standards are a framework for innovation in education. These standards help educators and education leaders worldwide prepare learners to thrive in work and life (ISTE, 2020).

Likert Scale - A Likert scale "is composed of a series of four or more Likert-type items that are combined into a single composite score/variable during the data analysis process. Combined, the items are used to provide a quantitative measure of a character or personality trait. Typically, the researcher is only interested in the composite score that represents the character/personality trait" (Boone & Boone, 2012, p. 2, para. 2).

Social Learning Theory - is a theory proposed by Albert Bandura, explains that people learn through observation, imitation, and modeling (Cherry, 2021).

Synchronous-Remote learning where everyone from a given group is online at the same time using tools such as Zoom or Google Meet (Novato Unified School District, 2020).

Technology Integration - is the effective implementation of educational technologies to accomplish intended learning outcomes (Davies & West, 2013).

TIMS Matrix - The Technology Integration Matrix (TIM) was developed to help guide the complex task of evaluating technology integration in the classroom. This suite provides a framework for describing and targeting the use of technology to enhance learning (Winkleman, n.d.).

TUPS Survey - is an online survey instrument in the TIMS Matrix Suite that provides essential information about current teacher use and perceptions of technology. The TUPS looks at what teachers believe about the role of technology in the classroom, as well as their comfort and confidence with technology in general, with pedagogy of technology, with a variety of different specific technologies, and it also asks about the frequency that they use those technologies and the frequency with which their students use those technologies. The survey includes 200 items in seven categories and provides valuable data to guide school- and district-level decision-making (Winkleman, n.d.).

Delimitations, Limitations, and Assumptions

The scope of the study was bounded by the delimitations, limitations, and Assumptions. The time frame was specific and encompassed unique circumstances. The location limited the study to one school district in a rural setting and participants were from limited content areas. Finally, assumptions were necessary to strengthen research reliability and study fidelity.

Time Frame and Study Location

Data was collected during the Spring 2021 semester. During this time, the study school was fully masked and hybrid. The study site was at a Mid-Western eighth through 12th grade high school in a small rural town in southern Missouri that housed 1,125 students and 85 teachers.

Participant Criteria

The participants of this study fell into two categories: students and teachers. The student participants included students who enrolled in English II and/or Government at the site school at the study time. The participants included sophomore and junior grade level students, 15 through 17 years of age. The full-time employed teacher participants taught either English II or Government. At the study time, the research school site had 10 females and five males who taught English II and Government courses. Qualified participants were enrolled in English II and/or Government during the 2020-2021 school year and teachers taught English II or Government during the 2020-2021 school year.

Assumptions

The following assumptions applied:

1. The participants willingly offered honest responses.
2. The sample represented educators within the study sites' general population who held teaching certificates from the Missouri Department of Elementary and Secondary Education (MODESE).

Summary

Chapter One discussed the background of the study, which described how the Covid-19 global pandemic had been a challenge for all involved in education. Educators

worldwide worked hard to support students' academic and social needs, and the same was true for the study school. Next, the researcher discussed the purpose of this study, which explained the importance of shedding light on the challenges that one rural high school faced during the pandemic, how they met the technological needs that Covid-19 presented, how teachers responded to these needs, and how student academic achievement was affected. Research was limited and therefore provided limited research outcomes on the effect the Covid-19 pandemic had on educators teaching and students learning, which led to the purpose of the study, to analyze how teachers' digital proficiencies affected student achievement during a time of hybrid learning, which was a response to the Covid-19 pandemic. Also explained in Chapter One was that this research study relied heavily on the concept of self-efficacy, founded by Albert Bandura.

Furthermore, Chapter One included a description of the mixed-method study to not only provide numerical data to examine the correlation between teachers' digital proficiency and student academic success, but to analyze qualitative data to tell the story from the teachers' and students' points of view describing what it was like to teach and learn during a global pandemic. Furthermore, Chapter One included a detailed explanation of the five instruments used to gather research data. Finally, Chapter One included important terms the reader needed to know to understand the essential concepts of this study fully.

Chapter Two includes research that explores various issues schools faced providing quality education for all students during the Covid-19 global pandemic. The literature review discusses how Covid changed the face of education resulting in disparities in equity, surges of hybrid instruction, increasing instructional technology and

teachers' correlating comfort and confidence levels. The literature review also discusses digital proficiency and the effectiveness of self-efficacy in teaching and learning. Furthermore, Chapter Two includes expanded descriptions on each researched topic by examining literature that supported and contradicted these focusses and theories. Finally, Chapter Two provides insight into the role that the Covid-19 pandemic played in changing public education and possible available solutions for education leaders.

Chapter Two: Review of Literature

Chapter Two discusses the current literature affiliated with the research in this study. The literature review examined related topics that affected society during the Covid-19 Pandemic. Additional literature topics reviewed include various teaching and learning proficiency issues before and during the Covid-19 Pandemic. Much of the research included in the chapter focuses on the value of teachers' self-efficacy and achievement outcomes possibilities when teachers' self-efficacy is high.

The Covid-19 Pandemic affected society in many ways, and education was not immune to this global game-changer. The Pandemic changed the face of education in a matter of days for schools worldwide (UNICEF, 2021). At the highest peak of the Pandemic, the forced school closures affected at least 55.1 million students in 124,000 public schools in the United States (Walton Family Foundation, 2020, para. 2). When examined at the worldwide level, it was discovered that 188 countries across the world experienced school closures (UNICEF, 2020, p. 5). With limited time, administrators everywhere worked to get devices to all students so that some resemblance of learning could still occur, but the results of their efforts are still yet to be seen (UNICEF, 2021).

Huguelet (2020) explained that Covid forced schools worldwide to make snap decisions concerning the avenue in which curriculum would be delivered, how to lessen the equity gap to ensure that all students had the same opportunity to learn, how to distribute basic school-provided necessities to students, and also how to support the mental well-being of students. The Pandemic also presented teachers with a variety of challenges. While technology's role was nothing new for some teachers, it forced others

to come to grips with this new era of education to provide an effective year of learning for their students (Huguelet, 2020).

Theoretical Framework

The theory of self-efficacy, a branch of Bandura's 1986 social cognitive theory, stresses the importance of an individual's perception of their own capabilities as a direct predictor of successful results (Gallagher, 2021). Research statistics show that high levels of teacher self-efficacy are linked to:

- Increased persistence and patience when helping struggling students learn.
- Greater willingness to try new approaches.
- Increased parental involvement in school.
- Higher levels of student achievement across diverse demographics.
- Increased job satisfaction.
- Lower levels of burnout, exhaustion, and apathy. (Leithwood, 2006, p. 42)

According to Mielke (2021), teachers with higher levels of efficacy are more likely to seek opportunities for growth and guidance. Individual teachers actively searching for these opportunities for growth will cause an increase in collective efficacy (Mielke, 2021). While the concept of self-efficacy is essential, as it serves as the foundation of collective efficacy and an important factor in teacher well-being, it is often left out of school improvement plans (Mielke, 2021).

The concept of efficacy serves as the study’s foundation because collective efficacy, that being when teachers of a district genuinely believe that they can positively impact student learning, continues to be acknowledged as a critical factor of student

achievement (Rebora, 2021). According to Guskey (2021), teacher efficacy is one of the most powerful contributors to student success.

According to Dweck (2006), the concept of efficacy has produced various adaptations over the years. Dweck (2006) explained “growth mindset” as “based on the belief that your basic qualities are things you can cultivate through your efforts, your strategies, and help from others…Everyone can change and grow through application and experience" (p. 7). Similar to Dweck's concept of growth mindset, Bandura (2001) described *agency*; “To be an agent is to intentionally make things happen by one’s actions. Agency embodies the endowments, belief systems, self-regulatory capabilities, and distributed structures and functions through which personal influence is exercised” (p. 2).

As evident in Frace’s 2021 research reveals, not everyone shares Bandura's unwavering belief in collective efficacy. France (2021) stated his concern that if collective efficacy is not examined with a critical lens, then all the research conducted on this topic could become another tool to "silencing and oppressing teachers" (p. 33). France (2021) explained that simply stating that teachers can merely do hard things, or if they believe it, they can achieve it, puts too much pressure on individual educators. France (2021) believed that working in public education in the age of Covid is more than a "hard thing" and often an unsustainable thing that "no amount of collective efficacy can make possible" (p. 33).

Pfleging and Cunningham (2021) showed that many teachers discovered their level of self-efficacy before the onset of the Covid-19 Pandemic was insufficient for meeting the challenges the global Pandemic presented to public educators. The Pandemic

introduced many challenges to teachers, such as the necessary adjustments to instructional practices, the ability to handle stress, the ability to implement new digital tools effectively, and the need to support student engagement in a digital world (Pfleging & Cunningham, 2021). This increased time of adversity showed the need for a specific type of self-efficacy, *crisis efficacy*, which is the belief in one's ability to succeed in standard settings and during a crisis (Pfleging & Cunningham, 2021). Mielke (2021) stated that in these times of crisis, schools often must act fast to ensure that students and teachers have all tools necessary for learning to continue. Mielke (2021) asked,

> How many times have we ushered in a new initiative without a solid plan for supporting teachers to be efficacious in its application? Sure, we might know what a teacher needs to do to improve. But do we model and support how to grow? (p. 16)

According to Guskey (2021), the question of how to cultivate teacher efficacy remains and three things must happen to increase teacher efficacy:

- Focus on changing teachers' experience
- Support teachers in using strategies that improve students 'performance and help them gather trustworthy evidence on those improvements
- Create situations where teachers can realize their actions have a significant favorable influence on their students' learning. Instead of directly changing teachers' attitudes and beliefs, we must change the experiences that shape those attitudes and beliefs. (p. 24)

For these changes to occur, Guskey (2021) encouraged school leaders to provide professional learning experiences for teachers that focus on evidence-based practices and

create procedures that allow teachers to obtain evidence that their positive impact on students is the key to growing teacher efficacy. It is a crucial school characteristic that has a good correlation with academic accomplishment. As a result, disparities in teacher self-efficacy and instructional conduct have been linked to collective teacher efficacy. Preston and Donohoo (2021) took the research a step further by examining the school leaders' role in increasing collective efficacy, which allows educators to strengthen their belief that they together, as a team, can positively affect change for each student. According to Preston and Donohoo (2021), school leaders must do four things to help their staff discover the source of collective efficacy:

- Ensure teams achieve success on tasks they may have thought were beyond their capability
- Share successes experienced by those who were faced with similar challenges and opportunities
- Convey high expectations paired with positive reassurance
- Maintain an atmosphere of positivity and optimism. (p. 27)

Collective efficacy is a crucial school characteristic that has a good correlation with academic accomplishment and as a result, disparities in teacher self-efficacy and instructional conduct have been linked to collective teacher efficacy (Liu, 2021).

Covid-19 Pandemic

In the spring of 2019, the world was introduced to a third coronavirus, Covid-19 (Wolf, 2020). According to the Centers for Disease Control and Prevention (CDC, 2021), the Covid-19 Pandemic has claimed the lives of 969,114 Americans to date, with a total of 79,571,321 cases (CDC, 2022, para. 1). Based on the World Health Organization

(2020) research, this Pandemic has presented a host of challenges to public health, food systems, public education, and the workforce. The economic and social disturbance caused by the Pandemic has led to millions of people at risk of falling into extreme poverty (World Health Organization, 2020). At the same time, the number of malnourished individuals is projected to increase to 132 million (World Health Organization, 2020, para. 1). To slow the spread of the virus, schools closed worldwide, resulting in almost half the world's students being affected by school closures at the one-year mark of the Covid-19 Pandemic (Wellcome, 2021).

Public Education Shutdown

In Spring 2020, the Pandemic forced almost all schools in the country to close, allowing as little as a few days to create a plan to deploy devices to all students in hopes of continuing education for students (Walton Family Foundation, 2020). The closures affected at least 55.1 million students in 124,000 public schools in the United States (Walton Family Foundation, 2020, para. 2). Because of this drastic amount, most states recommended that schools remain closed throughout the remainder of the 2019–2020 school year (Walton Family Foundation, 2020, para. 2). Missouri followed suit (The State of Missouri, 2020). All 555 school districts (both public and charter) reported closing by March 19, 2020, due to the Pandemic, which ultimately affected 914,875 Missouri students (Huguelet, 2020, para. 2). In a press release, Missouri Governor Parson announced that all schools in the state of Missouri would remain closed through the end of the 2019–2020 school year, due to the safety issues associated with the Covid-19 Pandemic (The State of Missouri, 2020). This recommendation, made to the governor by the Missouri Department of Elementary and Secondary Education, also clearly defined

the expectation that all schools were to continue educating students through alternative methods until the last day of school as indicated in their district calendar, as well as provide meals to students as needed (The State of Missouri, 2019).

Effects of Covid on Students

According to a report released in Pediatric Nursing (2020), one often takes for granted the importance of various community staples, such as schools, churches, and community centers and the impact on the community when those services are no longer available. The response to the Pandemic was different for varying socioeconomic groups, which increased the inequities between these status groups even more (Henderson et al., 2020). As reported by Bond et al. (2020), many low-income families frequently relied on these supporting community organizations and their services. These entities, as mentioned above, played a vital role in the social, emotional, mental, and behavioral development of young children, not to mention serving as a place for learning and socially interacting, and learning essential life skills. Often, these institutions were where children developed their sense of purpose and identity (Bond et al., 2020).

Due to the all-encompassing pandemic stressors, many children also experienced post-traumatic stress disorder (PTSD) symptoms (Sprang & Silman, 2013). According to a report released by the Substance Abuse and Mental Health Services Administration (2021), one in seven students experienced maltreatment in the last year, with children from low socioeconomic status being at a higher risk (para. 4). While the recent low reported numbers of maltreatment may seem promising, it is because these cases of abuse and neglect have gone unreported since students are no longer interacting with

schoolteachers, nurses, and counselors due to the school closures resulting from the Covid-19 Pandemic (Campbell, 2020).

According to UNICEF's Office of Research (2020), 1.6 billion students worldwide had been affected by the necessary school closures, approximately 91% of the world's enrolled students (para. 5). While the Pandemic has affected people of all ages, children are the ones who will likely be most negatively affected and will deal with the long-term public health and socioeconomic impact of this global Pandemic (Henderson et al., 2020). As determined by the CDC (2020), child mental health problems were already widespread before the onset of the Pandemic. Of children 3 to 17 years of age, 3.2% are diagnosed with depression, 7.1% with anxiety, and 7.4% with a behavioral problem (CDC, 2020, para. 8). It only stands to reason that the Covid-19 Pandemic is increasing the mental health issue that continues to affect the young children of this country (Henderson et al., 2020).

Effects of Covid on Teachers

In addition to the challenges Covid presented to students, the school closures forced around 63 million teachers to adapt their instructional approach to meet the needs of students, which includes moving their lessons to a digital platform (UNICEF, 2020, para. 12). This move proved to be a challenge for the 300,000 to 400,000 public school teachers who lacked internet access or a digital device (Martinez & Broemmel, 2021, p. 110). While many view teachers as *go-to* individuals who deliver various services to children, teachers are also individuals in need of post-traumatic support of their own (Martinez & Broemmel, 2021). A 2020 article in the *National Teaching and Learning Forum* (Schwartz, 2020) asked nine teachers to reflect on their experience with going to

online learning in response to the global Pandemic. The primary sources of stress for teachers included feelings of uncertainty of the Pandemic, transitioning to a virtual instructional approach, and the desire to create a community and culture of caring among their classes (Schwartz et al., 2020). According to a 2020 study conducted by the Alberta Teachers' Association (ATA), the top concerns about pivoting to remote instruction of the over 8,000 teachers surveyed were lack of internet, especially in rural areas, and the resulting stress of teaching children online while many were juggling the homeschooling responsibility of their own children (Hare, 2020).

Learning Loss Versus Schooling Loss

The school closures, due to safety precautions surrounding the Covid-19 Pandemic, led to many concerns and created many questions about the potential consequences for student learning (Engzell et al., 2021). Society widely supported school closures as an attempt to provide safety to students against the Pandemic; however, the cost and benefit of this move are still yet to be seen (Engzell et al., 2021). According to a recent study conducted by CNBC (Dickler, 2021), more than 97 % of educators reported seeing some learning loss that is more than that of years past (para. 4). This learning loss serves as the main challenge for public schools: how to measure the learning loss that occurred due to the Pandemic, or if even to measure it at all (New York Times, 2021). According to Dougherty and de Leon (2021), the first debate to settle is whether this phenomenon is learning loss or schooling loss. Whereas learning loss is more focused on the numbers associated with loss, the phenomenon of schooling loss holds tight to the belief that there is more to the experience of school than what is in a book, including social and emotional learning, extracurricular activities, athletics, and nutrition services,

all things that many believed suffered during school closures (Dougherty & de Leon, 2021).

Learning Loss

Learning loss refers to the academic knowledge students lose while they are not in school, a theory stating that learning diminishes over time if students do not interact with their new knowledge regularly (Chalk, 2021). The term *learning loss* used to be associated with summer break, but the global Pandemic put a new spin on the term due to the average amount of school closure during the Pandemic being 3.5 to 5.5 months (Chalk, 2021, para. 6). According to a worldwide study conducted by UNICEF (2020), 108 countries reported missing an average of 47 school days due to school closures, which is the equivalent of one quarter of a school year (para. 9). Dorn et al. (2020) shared results from a study conducted in Spring 2020 that focused on how school shutdowns would widen the inequality gap, analyze the dropout rate, and the toll on learning.

According to the report released by Dorn et al. (2020), students, on average, began school about three months behind in mathematics than in an average year, with students being about a month and one-half behind in reading (para. 3). To answer this question of learning loss, Thompson (2021) suggested that the question requires clarification. Thompson (2021) believed that the correct questions to ask are *How much did students learn compared with students in past years in brick and mortar? How much was not able to be taught due to time constraints?* Many believe that these questions compare apples to oranges, and that there is much more to what students lost during the school closure than what can be measured on a test (Thompson, 2021).

Schooling Loss

According to research by Education Elements (2020), the Covid-19 global Pandemic has been the most severe event in a lifetime for many involved in public education, and its impacts have been felt worldwide. Many have debated the correct term to describe the loss that students are dealing with during this pandemic: *schooling loss* or *learning loss* (Education Elements, 2020). Education Elements (2020) reported that the term schooling loss is a more accurate depiction of the challenges faced by students in public education during the Pandemic because the term schooling is broad and encompasses learning as well as the loss of social and emotional supports, athletics, extracurricular activities, and district-provided meals.

While some believe that the priority in response to the school closures is to focus on student academic loss, there is another school of thought (Berger, 2021). Berger (2021) stated in an article in The Atlantic:

> Using the results in the same way after this pandemic year would not just be unfair; it could do real harm. If districts focus too much on remediating "learning loss"—holding kids back a grade, categorizing students according to their deficits, and centering lesson plans on catch-up work—the students who have experienced the most trauma and disconnection during the Pandemic may be assigned to the lowest level and most stigmatized groups. They will be viewed as deficient, and the inequities in place before and during the Pandemic will be further amplified. Children, having been told that they are behind, will internalize the story of their loss. (para. 3)

Berger (2021) suggests that society needs to consider if it truly wants to characterize children by their limitations rather than their potential the next time you hear the phrase *learning loss*.

According to Ewing in a 2020 Forbes article, the term *learning loss* is the educational feature of the Pandemic and originates from *test enthusiasts* (Ewing, 2020). While some, such as Ewing, focus on the "learning loss" and want to gauge the magnitude of that loss by using standardized tests, others, such as Niccolls and Midles (2021), believed that the issue is more than learning loss. They think that students are not doing school-peer interaction, connection with teachers, extracurricular activities, etc. Based on Gabriel's (2020) research, the argument is that students are learning every day, even during the shutdown. According to a 2020 article in The Washington Post, Gabriel (2020) explained that students are learning certain skills of the new normal, such as how to reset the structures of their days, different avenues of communication, as well as perhaps a unique role in the home that the Pandemic has forced upon them. Gabriel (2021) took it further in her 2021 follow-up article. Gabriel (2021) pointed out that students and teachers continued to learn despite the failures of public schooling. Gabriel (2021) explained that when students were told that their efforts to interact with the school that year were insufficient, they continued to learn about themselves and the school. When they saw some districts open in person and others not, when they saw some people immunized and others not, they learned about inequality (Gabriel, 2021). Students discovered that the world still assumes that all children live with their parents and that doing so is safe. In Gabriel's (2021) research, she gives further explanation concerning this idea of a *new normal:*

> Students learned to take gym class on YouTube, that people you have never met can be your greatest teachers, that the ability to go outside and play during the day makes every day brighter, and that their safety depends on the decisions of others. They learned that contrary to the messages in some schools, learning does not require feet on the floor, hands on their desks, and eyes tracking the speaker. They learned what taking breaks does for them as learners, and what conversation and companionship means for them as individuals. (Gabriel, 2021, para. 4-7)

Gabriel (2021) shared that she believes teachers discovered that an already condensed curriculum should look different at home. Family members, friends, and neighbors are a resource for supporting, extending, and elaborating on what happens at school in ways we cannot predict (Gabriel, 2021). As explained by Gabriel (2021), "But it is not a loss of learning" (para. 2). Instead, Gabriel (2021) explained her belief as a loss of a previously imagined path headed toward a previously imagined future. Gabriel (2021) clarified that learning is never lost, though it may look different than planned or measured initially.

While students experienced loss during the school closure, whether it be learning or schooling loss, this led to debates of what educators should measure (Merrill, 2021). According to an interview with Ron Berger, Merrill (2021) recently reflected on society's all-consuming need to measure academic progress and loss "to the decimal point-an enterprise that feels at once comfortably scientific and hopelessly subjective is also woefully out of tune with the moment" (para. 5). Berger (2021) suggested that instead of using assessment results as labels, use them as a guide only, a tool for teachers to refer to as they work with students to understand their set of skills and help them own their growth and development. Additionally, Berger (2021) recognized that students faced a

great challenge and lost a large amount of academic growth, but the key is to assess students' abilities to motivate them to grow (Merrill, 2021).

Moving Forward

Berger (2021) has not shied away from voicing his opinion against learning loss and therefore in favor of the concept of schooling loss, but he recognized that the intent of remediating learning loss is good yet believes that students are resilient and not broken and "as long as kids feel like their job is to come to school to be fixed, their hearts won't be in their work" (para 3). Recently, Strauss (2020) revealed that some refer to this generation as the *Covid Class*. The group of students in the class has been told that using too much technology to stay connected to others is bad for brain development, and they are learning far less than other generations and perhaps not even understanding anything at all (Strauss, 2020). Strauss (2020) believes students need to hear the opposite, and the solution is the language used around this generation of students. Using words such as *slide*, *loss*, *waste*, and *gap* to describe the learning, or lack thereof, during the Pandemic could affect how students feel about their intelligence (Strauss, 2020). However, words such as *welcome* and *wonder* have the power to acknowledge and appreciate learning that took place during a time of alternative learning and the challenges that students had to overcome (Strauss, 2020).

While the global Pandemic has been an apparent tragedy, it can also be an opportunity (Merrill, 2021). Bambrick-Santoyo and Chiger (2021) viewed this worldwide catastrophe as an opportunity to revamp education in a way that reaches all students. Instead of focusing on learning loss, Bambrick-Santoyo and Chiger (2021) suggested exploring types of teaching that work for everyone. One way to reach all students is to

investigate a unique approach to instruction, to veer away from standardization and instead embrace personalization, which has the potential to take education into a new era of post-pandemic teaching and learning (Niccolls et al., 2021).

Engzell et al. (2021) believed that tragedy often serves as a window allowing an authentic view of a situation. The Covid Pandemic is changing society enormously by providing unforeseen opportunities and exposing major issues with glaring inequities (Engzell et al., 2021). The Pandemic revealed poverty, race, disability, and rural isolation problems and increased the disparities of these differences (Merrill, 2021). These were not new issues; however, the pandemic exposed these issues and, unfortunately, intensified their effect on student learning (Thompson, 2021).

Not all schools will return to seated learning simultaneously or even in the same manner (Strauss, 2020). Some schools may stay remote, others may go hybrid, while others will return to 100% face-to-face instruction (Strauss, 2020). Strauss (2020) stressed that the important thing is to recognize that all students, no matter what their school closure experience looked like, learned something valuable and can experience continued learning. According to Merrill (2021), how public education handles returning to school will be a monumental decision and if this opportunity is not handled correctly, it could be a "failure of imagination" (para. 8).

Online Learning

It was hard to believe that students and teachers would not be back for the start of a new school year in the fall of 2020, after being sent home in March 2020 due to Covid, but many schools began the new year with some type of virtual instruction (Promethean, 2020). This new role of online teaching was vital to the success of a *new normal* in

education (Strickland, 2021). Still, according to the *U.S. State of Technology* survey done by Promethean (2020), only 20 % of educators surveyed considered their schools to be prepared for the onset of virtual instruction (para 2).

Horn et al. (2017) discussed that school officials designed schools to standardize the instructional approach of the classes in ways that the students learned and are assessed. Additionally, Horn et al. (2017) stated that the education system replicated the successful factory model of the early 1900s. Categorizing students by grade levels and classrooms allowed teachers to teach the same subjects using the same pace and manner, which allowed officials to enroll larger numbers of students into public education (Horn et al., 2017). Creating schools like factories resulted in a 25% enrollment increase in 30 years, and in turn, thrust many individuals into jobs that allowed them to enter society's middle class (Horn et al., 2017, p. 6).

While the factory model of education worked well for the society of 1930, it fell short in later years (Horn et al., 2017). Additionally, according to Horn et al. (2017), 60% of today's jobs require knowledgeable workers, and society expects schools to prepare students for these occupations (p. 7). However, the original factory model did not consider the needs of each student, but instead generalized students into grade levels. Current education realizes that each child has different needs and learns at a different pace. There are two reasons that students learn in different ways and at varying rates. First, everyone has a different mental capacity, regulating how much working memory we have. Second, students' life experiences, or background knowledge, must be considered. The life experience that each student brings into their learning experience affects how they process the new information. This new understanding of students' needs

and various learning styles results in a necessary demand for a more customized approach to education, which is a great challenge, though, considering public education still uses the standardized model of its origin (Horn et al., 2017).

As expressed by Boettcher et al. (2021), the global Pandemic has forced education to meet the needs of each student, even when those students are not seated in the physical classroom. As the demand for online instruction increases, many educators are assigned to online instruction platforms without appropriate support (Boettcher et al., 2021). According to *The Online Teaching Survival Guide* (2021), schools expect teachers to use whatever resources are available on their campus to prepare for online teaching. These expectations seem to convey a belief that online teaching is very similar to face-to-face instruction, but Boettcher et al. (2021) explained that is not the case. While great teachers can be successful in online instruction, they must consider certain aspects of online teaching (Boettcher et al., 2021).

Furthermore, Boetchher et al. (2021) believed, one main difference between face-to-face instruction and blended instruction is the role of the instructor. Additionally, Boetchher believed that in blended learning, the instructor serves more as a guide than the primary source of information. They also suggested that the role of the student differs in online learning in that they are more in charge of their learning, having more options of how to learn new concepts and how to display their understanding. The resources available to online learners are another significant difference in the two modes of instruction. Online students have an immense number of resources available at all times. Therefore, Boetchher et al., 2021, believed that it is essential to consider the type of class

discussion as most online courses utilized an asynchronous method of conversation, as opposed to the synchronous means of a seated class (Boettcher et al., 2021).

According to Boettcher and Conrad (2021), there are certain best practices that lead to successful online teaching and learning:

- Be present at the course site.
- Create a supportive online course community.
- Develop a set of explicit expectations for your learners and yourself as to how you will communicate and how much time students should be working on the course each week.
- Use a variety of large group, small group, and individual work experiences.
- Use synchronous and asynchronous activities.
- Ask for informal feedback early in the term.
- Prepare discussion posts that invite responses, questions, discussions, and reflections.
- Search out and use content resources that are available in digital format.
- Combine core concept learning with customized and personalized learning.
- Plan a good closing and wrap activity for the course.
- Assess as you go by gathering evidences of learning.
- Rigorously connect content to core concepts and learning outcomes.
- Develop and use a content frame for your course.
- Design experiences to help learners make progress on their novice-to-expert journey. (p. 45)

Because of their online teaching experiences, many educators report making beneficial adjustments in their face-to-face classes (Nilson & Goodson, 2021).

Online Learning Types

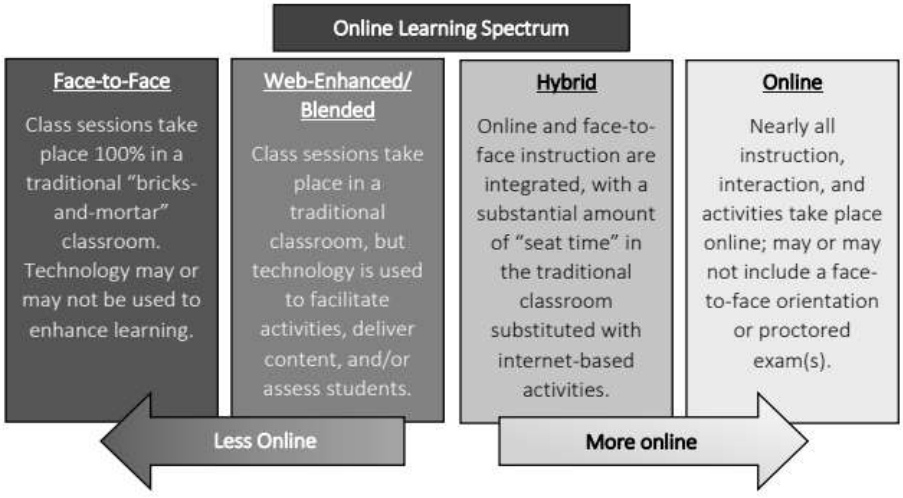
While online instruction does have unique challenges and its own set of expectations, the core principles of quality instruction hold true across all learning platforms (Nilson & Goodson, 2021). According to Nilson and Goodson (2021), quality teaching is quality teaching, and furthermore, ineffective teaching is ineffective teaching, regardless of the learning environment because learning is learning. Put simply, outstanding teaching is not defined by the environment (Nilson & Goodson, 2021).

In 2000, around 40,000 K-12 students enrolled in at least one online course, but most of these students did so to recover credits necessary for graduation (Horn et al., 2017, p. 34). By early 2021, schools offered a wide variety of online learning opportunities, including remote, hybrid, in-person, or a combination of these (NCES, 2021). According to the NCES (2021), in February 2021, 43% of students in fourth and eighth grade were enrolled in remote instruction, 21% enrolled in hybrid instruction, and 35% were enrolled in in-person instruction (para. 4). NCES (2021) revealed that this shift from remote instruction being the primary method of online learning to students now having a variety of online learning to choose from stems from the realization that the physical location of where students learn does not matter anymore, assuming a learner has a strong internet connection. As online learning continued to evolve, educators discovered that the number of students who can work independently without direct instruction and guidance of an adult is limited (NCES, 2021).

Parents knew that one of the primary duties of the schooling system was to watch over children and keep them safe while parents worked (Horn et al., 2017). For some, the physical location of learning mattered less. For example, some students need a safe place during the day (Horn et al., 2017). Therefore, the concept of blended learning was born, resulting in a significant leap forward in incorporating online learning into the mainstream of public education (Horn et al., 2017). A course is considered online if at least 80% of the content is delivered online (Smith & Cynthia, 2014, para. 1). Additionally, a course in which 30–80% of the content is delivered online, combined with face-to-face instruction, is considered a blended or hybrid course (Smith & Cynthia, 2014, para. 1). The terms *hybrid* and *blended* are two terms in the online learning spectrum, as noted in Figure 1.

Figure 1

Online Learning Spectrum



Note. Introduction to Hybrid Teaching, by the Center for Excellence in Learning and Teaching (CELT) at Iowa State University is licensed under Creative Commons BY-NC-

SA 4.0. This work, Introduction to Hybrid Learning, is a derivative of the Introduction to Hybrid Learning developed by College of DuPage (2022, April 24).

Online Learning Versus Face-to-Face

According to research by Glass and Sinha (2018), In the last century, there have been significant changes in the kinds of instructional technologies available to both teachers and students. Many studies have tried to answer whether online instruction is as effective as classroom instruction (Glass & Sinha, 2018). Although the difference between seated instruction and online and blended courses is becoming smaller and smaller due to advances in technology and a better understanding of active teaching, no matter the instructional mode, the debate of which approach is most effective remains (Boettcher et al., 2021).

Studies have shown that one advantage of face-to-face instruction is the belief that learning is a social act and humans are social creatures (Glass & Sinha, 2018). Another aspect of learning that is more prevalent in seated instruction is the opportunity to discuss course content (Glass & Sinha, 2018). This discussion allows for an opportunity for authentic engagement that is often lacking in online learning (College of DuPage, n.d.)

While face-to-face instruction encourages real-time engagement, online learning excels in allowing for independent exploration and student ownership of learning (College of DuPage, n.d.). Research by College of DuPage (n.d.) points out that class discussion is not absent from online learning but is done differently. For example, while in-person engagement may make some students uncomfortable, online discussions allow students time to develop their thoughts and are a less intimidating way for some students to participate in essential discussions (College of DuPage, n.d.). The primary advantage

of online learning is that it allows students to learn in any location, whether at home, due to personal preference, or due to a necessary quarantine. However, the debate of the most effective mode of instruction remains unsettled due to the recognition of the need for social interaction since humans are the most social of all animals (College of DuPage, n.d.).

Hybrid Teaching and Learning

Hybrid Teaching and Learning is an instructional approach that uses face-to-face instruction with some type of online learning (O'Byrne & Pytash, 2015). Furthermore, hybrid instruction occurs anytime a student is in a seated classroom part of the time and online another part of the time, with student control of learning being a constant consideration (O'Byrne & Pytash, 2015). The goal of hybrid instruction is like that of all instruction: to help teachers with the ultimate goal of helping each student reach a mastery level of learning (O'Byrne & Pytash, 2015).

According to Horn and Staker (2017), the concept of hybrid learning combines the successes of traditional seated instruction with the benefits of innovative instruction utilizing technology, giving students and teachers the *best of both worlds*. O'Byrne and Pytash (2015) believed that while technology is a crucial component of hybrid instruction it must not drive instruction, which is the role of pedagogical goals. Instead, the instructional objectives are the first consideration, followed by how that goal looks in a hybrid learning model (O'Byrne & Pytash, 2015). As O'Byrne and Pytash (2015) believed, although the course content does not change in hybrid instruction, the delivery method does, so educators must change how they interact with students to have a successful hybrid experience. Since hybrid instruction combines face-to-face and online

learning, the expectation of a hybrid class is to have more active learning occur during the seated portion of hybrid learning (O'Byrne & Pytash, 2015). Therefore, the method of guiding students to complete a particular aspect of a learning activity is now a significant planning consideration in hybrid lessons (O'Byrne & Pytash, 2015).

The report, A National Primer on K-12 Online Learning (Watson, 2007), identified four critical skills required for transitioning to hybrid learning. First, Watson (2007) believed that communication is vital. Second, according to Watson (2007), time management is essential yet can also be challenging for students venturing into the world of online learning for the first time. Next, teachers need extra time to plan hybrid lessons due to the need for digital resources for hybrid learning. Finally, Watson (2007) stated that hybrid instructors need to be ready to differentiate for various learning styles and abilities present in their hybrid class.

O'Byrne and Potash (2015) asserted that hybrid learning is a perfect marriage of online and face-to-face instruction, but it is essential to examine the pros of this combination. Additionally, according to a report released by the College of DuPage (n.d.), teaching, learning, and academic success resulted from hybrid learning and was stronger than strictly online or face-to-face teaching. The flexibility that hybrid learning allows may be one reason for this success (Karabulut-Ilgu & Jahren, 2015). With a hybrid learning instructional approach, students were free to pace themselves, experience more choice in how they engaged, demonstrate their mastery of concepts, and teachers could offer more various methods of presenting the material (College of DuPage, n.d.). Furthermore, the researcher revealed that students are not the only ones experiencing growth with hybrid learning, as hybrid learning seemed to be a catalyst for instructional

growth and change in educators (O'Byrne & Pytash, 2015). According to O'Byrne and Pytash (2015), "Much of the power in hybrid learning comes from modification or manipulation of time, space, and place to improve teaching and learning." (p. 138).

Like most aspects of education, there is no one perfect way to blend face-to-face and online learning (O'Byrne & Pytash, 2015). However, hybrid instruction faces severe barriers that make moving from traditional methods of instruction challenging for some (O'Byrne & Pytash, 2015). According to a 2020 survey conducted for District Administration (2020), 31% of respondents believed the digital divide to be the significant barrier of hybrid learning, followed by the "Summer/Covid Slide" at 26% (para. 8). Finally, 25% believed that budget cuts were the main challenge of hybrid learning (para. 8). Forty-three percent of those surveyed also noted the need for more teacher training on technology for hybrid learning to succeed (Burt, 2020, para. 9).

The biggest challenge of the hybrid instructional approach is figuring out how best to combine the two methods (face-to-face and online), to use the best of both worlds (College of DuPage, n.d.). Many educators struggle with this challenge, resulting in experiencing hybrid fails for one of the following reasons:

- Simply using the seated curriculum and adding online assignments results in more work for the students but not necessarily richer learning experiences.
- Combining the two instructional models (face-to-face and online) in a choppy manner leaves the students working their way through disjointed lessons instead of a cohesive curriculum.

- Only using the in-person time for student-student/student-teacher interaction. Quality collaboration can take place online also via discussion boards, video sessions, etc.
- Clinging tight to the traditional assessment schedule. Hybrid learning needs to include frequent checks for understanding, allowing for corrections when necessary.
- Collaborative work and portfolios can also replace the conventional assessment and allow students to demonstrate their learning better. (College of DuPage, n.d., p. 16)

Fisher et al. (2020) reminds educators that are working in two modes: online and face-to-face, "What matters is what you do, not where you teach." (p. 170). They believe that effective teachers are effective whether they teach in a building or from their home (Fisher et al., 2020).

Efficacy and Teacher Self-Perception

Previous research indicated that self-efficacy, a concept built on the social learning theory, emphasizes the belief that people are active participants in shaping the directions of their lives and careers (Hatlevik, 2016). Bandura, the founder of the concept of self-efficacy, explained that the basis of self-efficacy conveys the idea that projecting individual confidence on his/her team affects the team performance (Donohoo et al., 2018). *Self-efficacy*, according to Bandura (1998), is defined as "belief in one's capabilities to organize and execute the courses of action required to produce the given attainments" (p. 73).

The self-efficacy theory plays a vital role in teachers' success (Kavanagh & Bower, 1985). Kavanagh and Bower (1985) suggested teacher self-efficacy and collective efficacy are key factors that are directly related to student achievement and positive changes in an organization. Additionally, teachers' belief in themselves and their abilities to positively impact student achievement is integral to successful, positive school change (Donohoo et al., 2018). Kavanagh and Bower (1985) also suggested how people perceive their personal abilities depends on their self-belief more than their actual skill level. Bandura provided a different foundational theory of self-efficacy, denoting the theory of *Collective Efficacy*, which he defined as a group's belief in their ability to organize and execute plans to reach goals (Donohoo et al., 2018). The theory of collective efficacy applies to schools when teachers believe in their ability as a group to affect student achievement, and students' results are considerably higher (Bandura, 1993). Collective efficacy potentially influences how teachers think, behave, and motivate themselves, which is a critical dynamic in the overall school culture (Donohoo et al., 2018). For example, Donohoo et al. (2018) posited that common beliefs and high expectations become a common language focusing on student learning instead of instructional compliance. However, Thornton et al. (2020) proclaimed that relationships between efficacy and school culture have other perspectives. For example, a building's culture can affect the self-perceptions and teachers' efficacy, ultimately affecting their teaching abilities (Thornton et al., 2020). Ultimately, either way one looks at the correlation between efficacy and school culture, the power of collective efficacy is evident (Donohoo et al., 2018). Hattie's Visible Learning research analyses consist of over 1,500 meta-analyses and places collective efficacy as the top influence on student achievement

(Hattie & Clarke, 2019, p. 3). Donohoo et al. (2018) concurred that collective efficacy was three times more effective on efficacy than socioeconomic status (Donohoo et al., 2018, p. 41). In addition to Hattie's research, Eells' (2011) explained that teachers' beliefs about their school and colleagues are closely tied to student achievement across all content areas.

Efficacy Student Achievement

Tschannen-Moran (2011) defined teacher *self-efficacy* as "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (p. 783). While teacher efficacy pertains to teachers' beliefs about their abilities, collective efficacy focuses on the entire faculty's belief in their potential and ability to increase student achievement (Thornton et al., 2020). A teacher's sense of self-efficacy can also be a powerful predictor of their effective and productive instructional practices (Thornton et al., 2020). According to Thornton et al. (2020), this is important because teachers are the first in line and serve as the primary source of educating students and impacting their achievement. Efficacy plays an essential role in achievement, as it determines successful teacher performance and effectiveness (Thornton et al., 2020).

Vast amounts of research have concluded there are positive connections between teacher efficacy, collective efficacy, and student achievement (Thornton et al., 2020). Additionally, when teachers have high confidence levels in their instructional abilities and their ability to influence student achievement, they are more likely to positively affect students’ academic achievement (Kim & Seo, 2018). Furthermore, the power of efficacy can be seen at the building level as well (Donohoo et al., 2018). Donohoo et al.

(2018) suggested that research on collective efficacy models showed that as teachers experience success, their confidence increases, increasing student achievement. According to Kim and Seo (2018), the correlation between teacher efficacy and student achievement is higher than that of teacher efficacy and other school factors.

In contrast, while much research supports the theory that high levels of teacher and collective efficacy result in higher levels of student achievement, not all agree (Corkett et al., 2011). Several researchers have found no connection between teacher efficacy and student achievement (Corkett et al., 2011). Kim (2012) explained her belief that while teacher efficacy is a positive factor in student achievement, it does not directly correlate with student achievement but instead has an indirect effect on achievement. Kim and Seo's 2018 research suggests that he inconsistencies in the effectiveness of teacher efficacy beliefs on student achievement may be due to the varying definitions of efficacy itself. For example, as Kim and Seo (2018) explained, another possible reason for the different views of the power of efficacy depends on outside factors such as gender, prior achievement level, and grade level. In addition, Kim and Seo (2018) indicated that a school's location (urban, rural, or suburban) is another debated variable that affects the teacher efficacy effectiveness on student achievement. Research shows that a final factor that determines teacher efficacy effectiveness is teacher experience (Kim & Seo, 2018). For example, in cases where teachers had many years of experience, the correlation between teacher efficacy and student achievement was high but almost insignificant when examining new teachers' self-efficacy effectiveness (Kim & Seo, 2018). Kim and Seo (2018) have shown that teachers with more experience and a higher level of efficacy have more significant effects on student achievement than teachers with

fewer years of experience. Kim and Seo's 2018 meta-analysis that analyzed results of 16 studies involving 4,130 teachers focused on the possible effect of teacher efficacy and student academic achievement concluded that if teachers have a higher level of confidence in their teaching abilities, they bring a greater amount of excitement and passion for learning into the classroom, and therefore, positively affecting student achievement (p. 531).

Efficacy and Anxiety

Bandura (1993) maintained that psychological and emotional factors influence self-efficacy. Thornton et al. (2020) believed that mandated state assessments, organizational changes, and societal issues quickly made education an extremely stressful occupation. Thornton et al. (2018) suggested that, ideally, teachers would have ample support to deal with these factors. These sources of stress can affect the self-efficacy of educators (Thornton et al., 2020). Thornton et al. (2020) found that experiencing success yields confidence and increases efficacy while alleviating stress. Task mastery, or completing a task to the point of mastery, is the most effective way to increase self-efficacy, according to Bandura (1993).

Additionally, Tschannen-Moran et al. (1998) explained that "the perception that a performance has been successful raises efficacy beliefs, which contributes to the expectation that performance will be proficient in the future" (p. 211). Furthermore, because psychological and emotional factors influence self-efficacy, emotional mood, either anxiety or excitement, leads to feeling competent or incompetent (Thornton et al., 2020). Finally, Thornton et al. (2020) noted that even a teacher with many years of

experience may perform below their ability level if they are struggling with feelings of incompetence.

Efficacy and Technology Use

Cam and Kivici (2017) revealed that society has exploded with technological changes drastically changing learning approaches. Due to these changes, society has prioritized becoming a society of instant information, dealing with science, and producing technology (Cam & Kiyici, 2017). For example, Cam and Kivici (2017) explained that rapid changes in technology development, and the learning methods of millennial students, had changed the meaning of the term literacy. *Digital Literacy* refers to the ability to "source information using the digital technologies, organizing information, analyzing, interpreting, evaluating, transferring, and also reading and writing digital texts through the information production process" (Cam & Kiyici, 2017, p. 30). Cam and Kiyici (2017) noted that possessing or requiring that one has digital skills was non-existent in past generations. However, digital knowledge requirements changed to adapt to new generation communication needs (Cam & Kiyici, 2017). Increases in digital capabilities have provided more significant opportunities for collaborative learning, which increased the demand for teachers to obtain digital literacy skills. As society's communication modalities changed, teachers' lesson requirements changed (Cam & Kiyici, 2017).

Several researchers have concluded that the teacher's Informal and Communications Technology (ICT) profile is very personal (Tondeur et al., 2019). Tondeur et al. (2019) explained that while some educators are naturally intrinsically motivated to use ICT, it is a challenge for others. According to Tondeur et al. (2019),

researchers have focused on three characteristics associated with educational ICT: ICT attitudes, ICT self-efficacy, and ICT competencies. According to Tondeur et al. (2019), ICT attitude refers to whether an educator enjoys or dislikes using technology. Teachers' attitudes toward technology can determine if they implement instructional technology into their teaching (Tondeur et al., 2019). This correlation is directly related to efficacy in the sense that teacher efficacy is a predictor of one's willingness to try new teaching methods (Thornton et al., 2019). Research has linked teachers' attitudes towards technology, technology efficacy, and ICT competencies (Tondeur et al., 2019). According to Hatlevik's 2016 research, teachers with lower levels of self-efficacy regarding instructional technology are less likely to use it in their classrooms. In comparison, those educators with higher levels of confidence in their digital proficiency are more efficient and effective users of instructional technology (Hatlevik, 2016).

Literature Review Synthesis

In America, the COVID-19 Pandemic likely hampered pupils' academic development in K12 settings (Ogodo et al., 2021, as cited in Cottingham et al., 2020; Dorn et al., 2020). The emergency changeover left school districts unprepared, resulting in unstructured formats that may have contributed to learning and schooling loss (Ogodo et al., 2021, as cited in Azevedo et al., 2020; Darling-Hammond & Hyler, 2020; Malkus et al., 2020). K-12 schools in the United States discontinued attending school in person due to the unprecedented COVID-19 outbreak. The CDC advised education leaders to move instruction to a virtual learning environment on the internet (CDC, n.d). Many teachers felt unprepared for this change and had significant difficulties in providing effective instruction in an online format (Francom et al., 2021). Bandura's (1977) self-

efficacy work noted that teachers with digital competency could adopt structured technology-based teaching and learning.

On the other hand, a teacher's limited educational technology knowledge or restricted use in instructional practice could lead to a lack of confidence. (Ogodo et al., 2021, as cited in Anderson et al., 2011). This research shows that teachers with high technology self-efficacy could effectively integrate technology into their classrooms to increase learning possibilities (Ogodo et al., 2021, as cited in Anderson et al., 2011). Unfortunately, many K-12 instructors who entered remote learning environments during the COVID -19 epidemic lacked operating digital competency, which may have created barriers affecting their self-confidence in producing effective instructional output (Ogodo et al., 2021).

Summary

Chapter Two included literature affiliated with the research in this study. The Literature review covered the related study topics encompassing the study's theoretical framework based on Bandura's social cognitive theory. Additional literature topics reviewed included various teaching and learning proficiency issues before and during the Covid-19 Pandemic. Much of the research included the values of teachers' self-efficacy and the achievement outcomes possible when teachers' self-efficacy is high.

The Covid-19 Pandemic changed almost all aspects of society, including public education. This study aimed to explore the effect that the hybrid teaching model had on student achievement, as well as the effect, if any, of the teachers' self-perception of their digital proficiencies on student achievement. Chapter Three describes the methodology used for this study, which includes a mixed-method approach to provide quantitative

numerical data and qualitative data, which paints a picture of what it was like for all involved in public education at the time of the pandemic. Two research questions and two hypotheses are examined, followed by an analysis of the research design, population, sample demographics, instruments, and data collection

Chapter Three: Methodology

Introduction

The study school, which was in a rural and impoverished area, decided to go 1:1 by providing each student with a school-issued Chromebook due to the Covid-19 Pandemic. As a result, the teachers and support staff went an entire year without professional development on effective technology integration that was initially planned. In addition, the study school adopted a hybrid instructional model, which resulted in teachers seeing their students two days per week, instead of five; both factors attributed to a year full of unforeseen challenges.

The purpose of this mixed-method study was to analyze how teacher digital proficiency affected student scores in grades 9 to 12, through the use of a hybrid instructional approach as a result of the global Covid-19 Pandemic. The quantitative portion of this study used the Technology Uses and Perception Survey (TUPS, 2020); the tool used to measure teacher perception of technology. This tool, which is a part of the TIMS Tool Suite (n.d.), informed the researcher of teachers' beliefs of the role of technology in the classroom, as well as their confidence and knowledge of digital proficiency.

Teachers' perceptions of their digital proficiency were analyzed by using an investigator-created perception survey, which was based off of the International Society for Technology in Education Standards (ISTE, 2020). The methodology included a perception survey to study students' perception of their teachers' knowledge of technology integration. The qualitative portion of this study used a *Qualtrics*-created

survey with a select group (volunteers) of teachers and students to gain their perspective on what teaching and learning was like during a global pandemic.

Although research has been completed concerning teacher digital proficiency, technology integration, and hybrid learning, very little of that research has focused on small rural schools in impoverished areas, and almost none of that research centered on the hybrid instructional approach during a pandemic, due to the fact that the pandemic is still active. Because there has been such little research conducted concerning the location and global pandemic aspects of this study, other comparable districts can learn from this study as they move forward with their own technology integration, including during a hybrid learning approach.

Research Questions and Hypotheses

There were two research questions and two hypotheses analyzed in this study. Each hypothesis had three focus areas that examined three perception areas of two different High School EOC courses in a Mid-west Rural school district.

- *Research Question 1:* What are teachers' and students' perceptions of the teachers' digital proficiencies?
- *Research Question 2:* What are the thoughts of teachers and students as it pertains to the factors that affect student achievement during the Covid-19 Pandemic?
- *Null Hypothesis 1:* There is no difference in students' Government and English II 2021 EOC scores based on the teachers' comfort and confidence levels with technology, perception of technology use, and level of technology integration.

- *Null Hypothesis 2:* There is no difference between scores of students who had hybrid teaching and learning those who did not.

Research Methodology

The purpose of developing a mixed-method study was to analyze how teachers' digital proficiency affected student achievement in grades 9 to 12 through a hybrid instructional approach, due to the global Covid-19 Pandemic. Both quantitative data concerning student achievement and also qualitative data, which were the feelings of teachers and students as it pertained to the highs and lows of teaching and learning during a global pandemic, were analyzed. Using a mixed-method approach allowed different data types to support increasing the overall strength of the study (Creswell, 2008). This mixed-method research design combined the strengths of the qualitative and quantitative approaches, making up for the weaknesses of each (Dawadi et al., 2021). According to Dawadi (2021), combining qualitative and quantitative research methods could be a better approach, allowing for deeper insights into the research that could be missed if using only one method.

Methodology Assumptions

- Distance between response alternatives on Likert scales are assumed to be equidistant; therefore, data are considered interval data.
- Respondents answered survey questions honestly.

Methodology Limitations

- One cannot assume that respondents perceive all pairs of adjacent levels on Likert-type scale questions as equidistant. For example, mid-point or neutral

point or zero point is a perception and therefore response bias cannot be measured or eliminated (Kreitchmann et al., 2019).

- Data analysis is limited to two areas and cannot be generalized across other core courses in the study site high school.
- The Government EOC assessment administered in 2021 was a completely different test than the 2018 assessment. Whereas the 2018 Government EOC relied heavily on basic recall skills, the 2021 assessment required students to utilize more critical thinking and reading comprehension skills.

Research Design

According to Dawadi (2021), combining qualitative and quantitative research methods allows for gaining deeper insights into research that could be missed if only using one single approach. This research study utilized a mixed-method approach to triangulate the data analysis allowing for deeper evidence-based outcomes and solid research-based recommendations for the study site education leaders.

Qualitative Design

Data Collection Instrument 1 was used to collect quantitative data to analyze teachers' perceptions of their digital proficiency by using an investigator-created perception survey, which was based on the ISTE Standards (ISTE, 2020; see Appendix A). Data Collection Instrument 2, also an investigator-created perception survey, based on the ISTE Standards (ISTE, 2020; see Appendix B) was used to gather data to study the students' perception of their teachers' knowledge of technology integration (see Appendix B). The qualitative portion of this study also used a *Qualtrics*-created survey with a select group (volunteers) of teachers and students to gain their perspective on

teacher digital proficiencies. To gain qualitative data, a questionnaire consisting of 11 open-ended questions for teachers and 10 open-ended questions for students that focused on the participants' views on education during the global pandemic was used. This data was collected to analyze Research Question 2. These qualitative data were collected by utilizing the *Qualtrics* software instrument required by the research university (see Appendix C).

Quantitative Design

Data Collection Instruments 4 and 5 were used to gather data to analyze Hypotheses 1 and 2. Data Collection Instrument 4, the Technology Uses and Perception Survey (TUPS, 2020), was used to measure teacher perception of technology. This data collection instrument, a part of the TIMS Tool Suite (n.d.), revealed teachers' beliefs of the role of technology in the classroom, confidence level of using technology, and knowledge of digital proficiency (see Appendix D).

Population and Sample

The study site was a high school in a rural town in southern Missouri. Teachers of varying experience levels and a sample of students were asked to participate in this study. Student representation came from a combination of grade levels from ELA and Government classes. The student population size was 1,125; 57 of those students were the sample size when gathering secondary data and 10 to 15 students of that sample size were asked to further their participation in the study by participating in open-ended questions, which was voluntary. Seven students responded to the survey. The teacher population was 85; six of those teachers were the sample size for secondary data. Ten to

15 teachers from the sample were given the opportunity to volunteer for the Open-Ended question portion of the study; nine teachers responded to the survey.

Sample Demographics

The sample for this study comes from one high school, particularly the ELA and Social Studies departments. The sample size for the study utilized a stratified sample probability approach to gather a sample size for the perception survey. The subgroups that were the focus of the sampling were the teachers' classes: either ELA or Government class and grade level. While ELA and Math were the commonly researched core areas, ELA and Social Studies were chosen for this study, because the Social Studies department in this particular high school consisted of a wide variety of teachers in the categories of age, experience, and technology comfort levels. For the *Qualtrics* survey portion of the study, which resulted in qualitative data, the researcher used a convenience sample, as it was based on a voluntary basis (Bluman, 2018).

Data Collection Instruments

A combination of instruments was used to collect qualitative and quantitative data as primary and secondary sources to answer two research questions and two hypotheses.

Data Collection Instrument 1 – Secondary Data

To analyze qualitative descriptive data, secondary data were collected to answer Research Question 1. The survey data was gathered from the school district study site which consisted of 7 Likert-Scale questions on the Teacher Perception Survey (see Appendix A). Teachers' perception questions correlated with ISTE standards and are described in Table 2.

Table 2

ISTE and Question Number Correlation

ISTE Standard	Teachers' and Students' Question Number Correlation
ISTE Standard for Educators #1	Question 1
ISTE Standard for Educators #2	Question 2
ISTE Standard for Educators #3	Question 3
ISTE Standard for Educators #4	Question 4
ISTE Standard for Educators #5	Question 5
ISTE Standard for Educators #6	Question 6
ISTE Standard for Educators #7	Question 7

Data Collection Instrument 2 – Secondary Data

To analyze qualitative descriptive data, secondary data were collected to answer Research Question 2. The survey data was gathered from the school district study site, which consisted of eight Likert-Scale questions on the Student Perception Survey (see Appendix B). Each question on the survey correlated with specific questions pertaining to ISTE Standards for Educators.

Data Collection Instrument 3 – Primary Data

To analyze qualitative data, the researcher created a questionnaire, which consisted of 11 open-ended questions for teachers and 10 open-ended questions for students, that focused on the participants' views on education during the global pandemic. These data, collected using the *Qualtrics* software instrument required by the research university (see Appendix C), were used to analyze Research Question 2. The researcher used a thematic data analysis method to determine emerging themes.

Data Collection Instrument 4 – Secondary Data

Secondary data were collected to answer Null Hypothesis 1 using the Technology Usage and Perception Survey (TUPS) to gain quantitative data. The TUPS Survey, created by the Florida Center for Instructional Technology (2020), was used to provide critical information about teachers' current use of technology, their perceptions of the role of technology in the classroom, and their comfort and confidence with technology in general. The use of this instrument produced a better understanding of teachers' beliefs regarding instructional technology in the classroom. This online survey examined teachers' beliefs about the role of technology in the classroom (TUPS, 2020). Each question on the survey correlated with specific questions about one of the three focus areas investigated in Hypothesis 1 regarding teachers' perception of technology use and teachers' comfort and confidence levels with technology. Students' 2021 EOC scores (Data Collection Instrument 5) were placed into categories based on the analyzed average outcome of teachers' answers on this survey.

Data Collection Instrument 5 – Secondary Data

To analyze quantitative data, secondary data were collected to answer Null Hypotheses 1 and 2. Government and English II EOC scores were gathered from the school district study site. The data collection instrument consisted of the district's Missouri EOC Portal housed at the Missouri Department of Education Website. (MODESE, 2021). Government and English II 2021 EOC scores were organized in categories based on answers from the Likert-Scale survey data collected on instrument 4 (see Appendix D).

Data Collection Procedures

Approval from the Institutional Review Board (IRB) was granted in April 2021. Once approval was given, the researcher sought approval to conduct the study at the particular study school from the superintendent of that district (see Appendix E). Next, ELA and Social Studies teachers participated in the TUPS survey, which revealed teachers' comfort and confidence level with technology, their perception of their technology use, and the level of technology integration initiated by each teacher. English II and Government 2021 EOC scores were also collected from the Missouri EOC Portal housed at the Missouri Department of Education Website. (MODESE, 2021). The EOC data were deidentified and securely uploaded to a password-protected LU server account. Data from a district-issued survey concerning teacher and student perception of technology use were collected via Google Forms. Teachers were de-identified by using a number as an identifier and students' identities were kept anonymous by identifying students by their student ID number instead of their name. The Student Perception Survey matched the teacher perception surveys, based on the ISTE Standards for Educators.

Separate emails were then sent to teachers and students, offering individuals an opportunity to participate in the primary data collection *Qualtrics* survey, which served as the qualitative portion of the study and considered primary data (see Appendix F). The invitation came via an email linked to *Qualtrics* survey, which included a "Consent on Behalf of an Adult and Assent Form" for parents and students to provide permission to participate in the study. Participation was voluntary, so participants did not feel coerced into participating. Signed assent/consent forms were required before participants could participate in the study. Those who signed and provided permission served as the study sample.

Data Analysis

To triangulate the data analysis of this study, qualitative and quantitative data were analyzed. Two research questions and two hypotheses were closely examined. The qualitative data answered Research Questions 1 and 2, and the Quantitative data answered Hypothesis 1 and 2. Hypotheses 1and 2 included subparts labeled $H_0$1A.1, $H_0$1A.2, $H_0$1A.3 and $H_0$2A.1, $H_0$2A.2, and $H_0$2A.3, as described in Table 3. For example, $H_0$1.A tested for differences in students' Government 2021 EOC scores based on their teachers' comfort and confidence levels with technology ($H_0$1.A.1), differences in scores based on the teachers' perception of technology use ($H_0$1.A.2) and differences based on teachers' level of technology integration ($H_0$1.A.3), while $H_0$1.B.1, $H_0$1.B.2, and $H_0$1.B.3 tested for the same differences but tested for the English II 2021 EOC scores.

Research Question 1

RQ1 - What are teachers' and students' perceptions of the teachers' digital proficiencies?

Participation from the Teacher Self-Perception instrument were analyzed to determine the teachers' perceptions of their digital proficiency. The participants included ELA (n = 6) and SS (n = 4) teachers who voluntarily participated in this survey. The Teacher Self-Perception Survey Instrument 1 (see Appendix A) was based on the ISTE Standards (ISTE, 2020), and aimed to show how teachers felt about their digital abilities pertaining to instruction. This instrument, comprised of seven questions, used a Likert Scale of high-medium-low to display teachers' thoughts of their digital abilities.

Participation from the Student Perception Survey instrument were analyzed to determine the students' perceptions of their teachers' digital proficiency. Students who

answered the survey focused on their ELA teacher (n = 101) and SS (n = 83) voluntarily participated in this survey. The Student Perception Survey instrument, based on the ISTE Standards (ISTE, 2020), aimed to show how students felt about their teachers' digital abilities pertaining to instruction. This instrument, comprised of eight questions, used a Likert Scale of high-medium-low to display students' thoughts of their teachers 'digital abilities.

Research Question 2

RQ1 - What are the thoughts of teachers and students as it pertains to the factors that affect student achievement during the Covid-19 Pandemic?

Participation from the *Qualtrics* Open-Ended Survey instrument were analyzed to determine the thoughts of teachers (n = 7) and students (n = 9) as it pertained to factors that affect student achievement during the Covid-19 Pandemic. First, to analyze Research Question 2, primary data were collected from the required research university's collection tool, *Qualtrics* which securely housed the questionnaire. There were 10 open-ended questions that focused on the participants' views on education during the global pandemic (see Appendix C). The participant responses were analyzed by looking for emerging themes presented in the thoughts of teachers and students. After discovering the emerging themes in the responses to each question, the researcher identified the frequency that participants mentioned identified themes for each question. Finally, pie charts were created based on the identified themes. The frequency was analyzed into pie charts providing a visual representation of teachers' and students' thoughts concerning factors that affected student achievement during the Covid-19 Pandemic. These open-ended

questions helped gain qualitative data concerning the factors participants believed affected student achievement during the Covid-19 Pandemic.

Null Hypothesis 1

$NH_0$1 - There is no difference in students' Government and English II 2021 EOC scores based on the teachers' comfort and confidence levels with technology, perception of technology use, and level of technology integration.

To answer Null Hypothesis 1, Government scores were labeled as $NH_0$1.A.1, using the Label *A* for Government 2021 EOC Score Analysis, and the Label *1* for Teachers' Comfort and Confidence Levels. Additionally, Null Hypothesis 1 was labeled $NH_0$1.B.1 using the Label *B* for English II 2021 EOC Score Analysis and the Label *1* for Teachers' Comfort and Confidence Levels. Finally, for Null Hypothesis 1, $NH_0$1.A.2, $NH_0$1.B.2, and $NH_0$1.A.3, and $NH_0$1.B.3 followed the same methods to categorize students' 2021 EOC data into the corresponding Likert scale central tendency outcomes category for each participating EOC teacher and Null Hypothesis, as displayed in Table 3.

Table 3

Null Hypothesis 1 Description by Survey Scales and EOC Course

Hypothesis	EOC Course (2021)	Survey Scales
1	A - Government B - English II	1 Comfort and Confidence
	A - Government B - English II	2 Perception of Use
	A - Government B - English II	3 Technology Integration

$NH_0$1.A.1 Government EOC and Perceptions of Comfort and Confidence

Two methods were used to analyze the effect of Teachers' Perceptions of Comfort and Confidence levels with Technology on students' 2021 Government EOC scores: one method for categorizing data and another method for analyzing data. First, secondary data were collected through the TUPS Survey Instrument 4 (see Appendix D, Questions 1-11). This portion of the survey utilized 12-Question, Likert-type scale questions pertaining to teachers' perceptions of their comfort and confidence levels with technology that revealed answers ranging from a low level to a high level of comfort and confidence with technology. The Likert scale ranges were treated as interval data and weighted to determine an overall central tendency mean for teachers for this portion of the survey, as described in Table 4.

Table 4

Likert Scale Range $NH_0$1.A.1-2; $NH_0$1.B.1-2 Comfort/Confidence; Technology Use

Weighted Scale	Central Tendency Range - Value	Verbal Interpretation
5	4.50 - 5.00	High
4	3.50 - 4.49	Medium High
3	2.50 - 3.49	Average
2	1.50 - 2.49	Medium Low
1	1.00 - 1.49	Low

Next, the researcher inserted students' 2021 Government EOC scores into the students' teachers' corresponding category of their weighted mean score outcome on the Likert scale. Finally, the appropriate statistical test was applied, as described in the analysis description of $NH_0$1.A.1– Government EOC and Teachers' Perception of Comfort and Confidence of Technology. For example, an ANOVA Test was applied to check the significance of the survey results and to reveal any possible statistical

differences in scores between the five prospective independent groups. Then, the appropriate Post-Hoc analysis was performed to determine where differences existed. If fewer than three categories of Likert scale scores occurred, an *F*-Test was used to determine differences in variance to determine which appropriate 2-sample, *t*-Test of independent means applied.

$NH_0$1.A.2 Government EOC and Perceptions of Technology Use

Additionally, two methods to analyze the effect of Teachers' Perceptions of Technology Use on students' 2021 Government EOC scores were used; one method for categorizing data and another method for analyzing data was used. First, secondary data were collected through the TUPS Survey Instrument 4 (see Appendix D; Questions 1-12). This portion of the survey utilized 12-Question, Likert-type Scale questions pertaining to teachers' perceptions of their technology use that revealed answers ranging from a low-level to a high-level of comfort and confidence with technology. The Likert scale ranges were treated as interval data and weighted to determine an overall central tendency mean for teachers for this portion of the survey, as described in Table 4.

Next, the same analysis methods were applied to $NH_0$1.A.2 to analyze the effect of Teachers' Perception of Technology Use on students' 2021 Government EOC scores. The Likert scale ranges were treated as interval data and weighted to determine an overall central tendency mean (see Table 4). Students' 2021 Government EOC scores for each participating teacher were inserted into their corresponding category of their weighted mean score outcome on the Likert scale of High, Medium High, Average, Medium Low, or Low. Finally, the appropriate statistical test was applied, as described in the analysis

description of $NH_0$1.A.2 – Government EOC and Perceptions of Technology Use, as described in the analysis methods for $NH_0$1.A.1.

$NH_0$1.A.3 Government EOC and Perceptions of Technology Integration

The researcher continued to use two methods to analyze the effect of Teachers' Perceptions of Technology Integration of students' 2021 Government EOC scores; one method for categorizing data and another method for analyzing data was used. Again, secondary data were collected through the TUPS survey Instrument 4 (see Appendix D; Questions 1-16). This portion of the survey utilized 16 Likert-type scale questions pertaining to teachers' perceptions of their technology integration that revealed answers ranging from Not at All to Multiple Times per Day. The Likert Scale ranges were treated as interval data and weighted to determine an overall central tendency mean for teachers, as described in Table 5.

Table 5

Likert Scale Range $NH_0$1.A.3- $NH_0$1.B.3- Technology Integration

Weighted Scale	Range - Value	Verbal Interpretation
6	5.5-6.0	Multiple Times Per Day
5	4.50-5.00	Everyday
4	3.50 - 4.49	Several Times Per Week
3	2.5-3.49	Once Per Week
2	1.50-2.49	Once per Month or Less
1	1.00-1.49	Not at All

Students' 2021 Government EOC scores were inserted into the students' teachers' corresponding category of their weighted mean score outcome on the Likert scale. Finally, the appropriate statistical test was applied, as described in the analysis

description of $NH_0$1.A.1 and $NH_0$1.A.2. For example, an ANOVA test was applied to check the significance of the survey results and to reveal any possible statistical differences in scores between the five prospective independent groups and the appropriate Post-Hoc analysis was performed to determine where differences existed. If fewer than three categories of Likert-type scale scores occurred, an *F*-Test was used to determine differences in variance to determine which appropriate 2-sample, *t*-Test of independent means applied.

$NH_0$1.B.1 English II EOC and Perceptions of Comfort and Confidence

The researcher used the same two methods that were used to analyze Hypothesis $H_0$1A.1 to analyze $H_0$1.B.1. First, secondary data were collected through the TUPS Instrument 4 (see Appendix D; Questions 1-11). This portion of the survey utilized 12 Likert-type scale questions pertaining to teachers' perceptions of their comfort and confidence levels with technology that revealed answers ranging from a low-level to a high-level of comfort and confidence with technology. The Likert scale ranges were treated as interval data and weighted to determine an overall central tendency mean for teachers for this portion of the survey, as described in Table 5.

As with the methods described in the analysis of $NH_0$1.A.1, the researcher inserted students' 2021 English II EOC scores into the students' teachers' corresponding category of their weighted mean score outcome on the Likert scale and the appropriate statistical test was applied exactly the same as described in the analysis description of H1.A utilizing the appropriate statistical test of an ANOVA or if fewer than three categories of Likert-type scale score occurred, an *F*-Test was used to determine

differences in variance to determine which appropriate 2-sample, *t*-Test of independent means applied.

$NH_0$1.B.2 English II EOC and Perceptions of Technology Use

To analyze the effect of the teachers' perception of their technology use on students' 2021 English II EOC scores, secondary data were collected through the TUPS instrument (see Appendix D). This survey utilized a Likert scale that revealed answers ranging from a low-level of perception of technology use to a high-level. The Likert scale ranges for this portion of the survey are described in Table 4.

Next, each teachers' score for the Perception of Technology Use survey were averaged to find their overall central tendency of technology use as either Low, Med Low, Average, Med High, or High. Then, students' 2021 English II EOC scores were inserted into the correlating category that represented the teacher's mean. The central tendency outcome (mean scores) for English EOC teachers fell into the two categories of Average and Medium High. To compare students' scores within the two categories, an Independent two-sample, *t*-test was determined as the appropriate statistical method to test the Null Hypothesis. A preliminary *F*-Test was used to test for equal variance was applied, then the appropriate independent two-sample, *t*-Test was applied to determine if the ELA teachers' perception of their own technology use had a different effect on students' 2021 English II EOC scores.

$NH_0$1.B.3 English II EOC and Technology Integration

The researcher repeated the same two methods to analyze the effect of Teachers' Perceptions of Technology Integration of students' English II that were described in the $NH_0$1.B.3. Again, secondary data were collected through the TUPS survey Instrument 4

(see Appendix D; Questions 1-16). This portion of the survey utilized the same 16 Likert-type scale questions pertaining to teachers' perceptions of their technology integration that revealed answers ranging from Not at All to Multiple Times per Day. The Likert scale ranges were treated as interval data and weighted to determine an overall central tendency mean for teachers, as described in Table 5.

As in the analysis of Government Scores for $NH_0$1.A.3, the researcher inserted students' 2021 Government EOC scores into the students' teachers' corresponding category of their weighted mean score outcome on the Likert scale. Then finally, the appropriate statistical test was applied, as described in the analysis description of $NH_0$1.A.1 and $NH_0$1.A.2, and $NH_0$1.A.3. For example, an ANOVA Test was applied to check the significance of the survey results and to reveal any possible statistical differences in scores between the five prospective independent groups and the appropriate Post-Hoc analysis was performed to determine where differences existed. If fewer than three categories of Likert scale scores occurred, an *F*-Test was used to determine differences in variance to determine which appropriate 2-sample, *t*-Test of independent means applied to determine if the perceptions of teachers' technology integration had different outcomes on 2021 English II EOC scores.

Null Hypothesis 2

NH02 - There is no difference between scores of students who had hybrid teaching and learning those who did not.

To answer Null Hypothesis 2, Government scores were labeled as $NH_0$2.A using the Label *A* for Government 2021 and Label *B* for EOC Score Analysis. Additionally, Null Hypothesis 2 was labeled $NH_0$2.A using the Label *B* for English II 2021 EOC Score

Analysis. Finally, for Null Hypothesis 2, $NH_0$2.A and $NH_0$2.B student data was categorized by the years, with 2019 representing a year in which traditional seated education took place, and 2021 representing a year in which students participated in hybrid learning, as displayed in Table 6.

Table 6

Null Hypothesis 2 Description by ELA EOC, Government EOC, and Data Year

Hypothesis	EOC Course (2021)
2	A - Government 2018 & 2021
	B - English II 2020 & 2021

$NH_0$2.A and $NH_0$2.B

To study this hypothesis and to test for significant differences, the student scores from the 2018 Government that applied to $NH_0$2.A, and 2019 English II EOC assessments that applied to $NH_0$2.B, were collected to show student achievement during years where traditional seated instruction took place, as well as English II and Government scores from the 2020-2021 school year when students learned in a hybrid setting, due to the Covid-19 pandemic. A random sample was generated in Excel to obtain the 30 student scores for both ELA and Government for all years involved in this study. A preliminary *F*-Test was used to test for differences in variance which revealed equal variances, then ran the appropriate Two-Sample, *t*-Test of Independent Means with Equal Variances to analyze results to discover if there were significant differences in student scores in the 2018 Government and 2019 English II EOC scores during a year with traditional learning versus the 2021 EOC scores during a year of hybrid instruction.

Ethical Considerations

The researcher's role as the Coordinator of Secondary Teaching and Learning in the site district was to oversee all aspects of curriculum, instruction, and assessment in grades 6 to 12. Coercion was not an issue because teacher evaluation was not a responsibility in the researcher's role. A qualified committee member was designated to deidentify teacher participants in order to keep teacher anonymity. Students' identities were kept anonymous by identifying students by their student ID number instead of their name. Teachers were deidentified as well, by using a coding system as an identifier. All collected and deidentified data were kept in a password protected file on a password protected computer.

Summary

Chapter Three outlined the research method used to answer the two research questions and to test two hypotheses. An explanation of the methodology, research design, study participants, instruments used, data collection and data analysis was provided. Additionally, the population samples and data collection procedures were described, and data analysis methods were explained. Finally, ethical considerations were described.

Chapter Four reveals the results of this study. Emerging themes from survey results concerning how teachers' perceptions of their own digital proficiencies affect student EOC achievement and the thoughts of teachers and students as it pertains to factors that affect student achievement during the Covid-19 Pandemic will be discussed to denote the results of Research Question 1 and 2. Additionally, difference of the results in students' Government and English II scores based on teachers' comfort and confidence

levels with technology, perception of technology use, and level of technology integration will be discussed, and differences between scores of English II students and Government students who had hybrid teaching and learning those who do not are also discussed to denote the results of Null Hypotheses 1 and 2.

Chapter Four: Analysis of Data

The researcher's analysis in Chapter Four aimed to investigate the relationship between teachers' perceptions of their digital proficiencies and student achievement, students' perceptions of their teachers' digital proficiencies and achievement, teacher comfort and confidence level with technology integration and student achievement, and the effect of hybrid teaching on student achievement. The researcher also attempted to determine the thoughts of students and teachers, as it pertained to factors that possibly contributed to student achievement during the Covid-19 pandemic.

Data Analysis Instruments

The researcher analyzed response data from Instruments #1 through #5 (see Appendices A, B, C, D, and E), which included answers to questions that were based on the ISTE Standards for Educators (ISTE, 2020); researcher-created open-ended questions; the Technology and Usage Perception Survey (TUPS), which utilized a Likert Scale; and End-of-Course (EOC) assessment scores. The teacher and student perception surveys revealed teachers' and students' thoughts regarding teachers' abilities to integrate technology effectively into instruction and the intentionality of the teacher to use technology to support student achievement (ISTE, 2020). Eleven open-ended questions revealed teachers' thoughts and 10 open-ended questions revealed students' thoughts about what teaching and learning were like during the Covid-19 Pandemic. Teachers' perceptions of their comfort and confidence with technology use, perception of technology use, and frequency of technology integration were analyzed by using the

TUPS instrument, and finally, EOC assessment scores were used to gauge the effect that a hybrid learning approach had on student achievement.

Research Question 1 Results

RQ1 - What are teachers' and students' perceptions of the teachers' digital proficiencies?

Ten teachers participated in the teacher perception survey, which consisted of four Social Studies teachers and six ELA teachers: two males and eight females. Four of those teachers taught less than five years, while the other six taught over 10 years each. For the student perception survey, 29 sophomore students completed the survey while focused on their English II teacher and 28 juniors focused on their Government teacher while answering the survey.

Teacher and Student Likert Survey Statement 1 Results

Statement 1, based on ISTE Standard #1 for Educators, states: *I continue to improve my practice by learning from and with others and exploring proven practices that use technology to improve student learning.* Figures 2 and 3 show the perceptions of teachers and students, as it pertains to Statement 1.

Figure 2

Teacher Perception Statement 1 Results

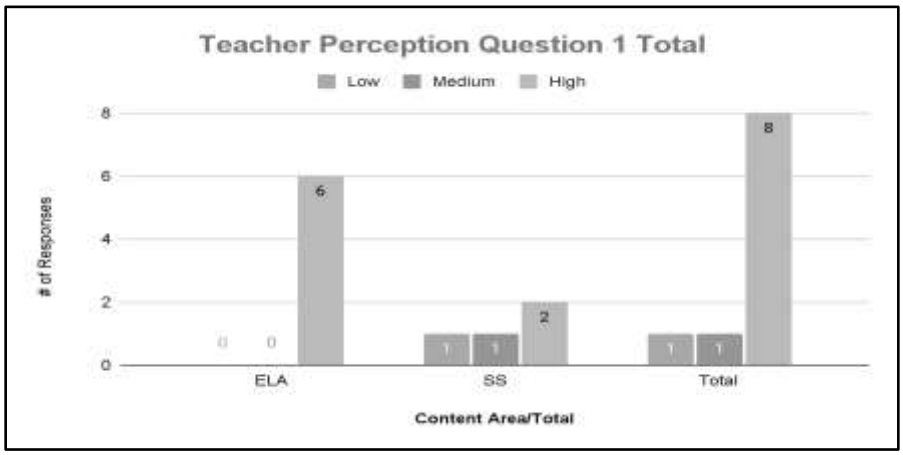
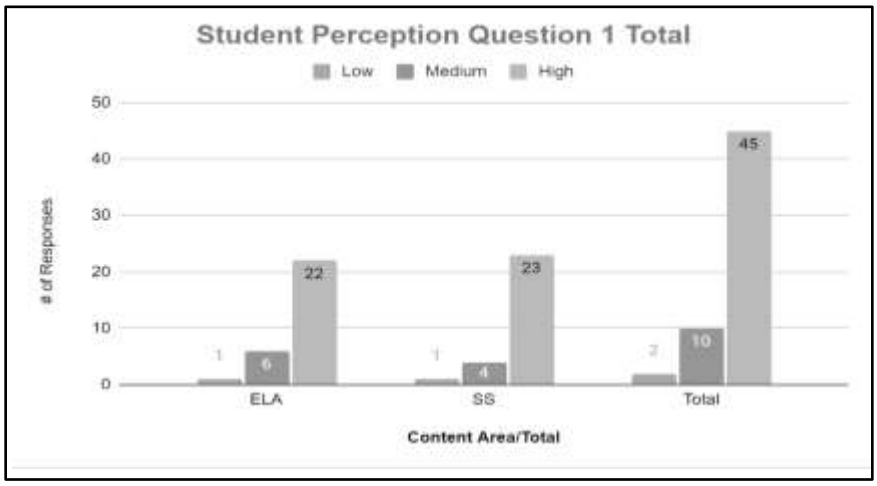


Figure 3. *Student Perception Question 1 Results*

Student Perception Statement 1 Results



There were 10 teacher participants who responded to Statement 1. Six teachers were ELA teachers (n = 6) and four teachers (n = 4) were Social Studies teachers. While all six out of six ELA teachers and two out of four Social Studies teachers answered that they viewed improving their practice by learning from others and exploring technology to improve student learning as a *High* priority, one Social Studies teacher felt that they made improving their practice a *Medium* priority, while one Social Studies teacher

viewed their efforts as a *Low* priority. While teacher perception is overall high concerning the teachers' intent to improve by learning from others, 20% of those surveyed still felt that they did not excel at this practice.

There were 57 (n = 57) students who responded to Statement 1. Twenty-nine students were ELA students (n = 29) and 28 were Social Studies students (n = 28). While 22 out of 29 ELA students and 23 out of 28 Social Studies students perceived their teachers as those that see collaboration as a purposeful practice, six ELA and four Social Studies students viewed their teacher's commitment to improve their practice as a *Medium* priority, and one student from each content area perceived their teacher's intent to improve their learning as a *Low* priority. The student perception survey showed that 79% of students felt that their teacher did seem to place a focus on using technology to improve learning.

Teacher and Student Likert Survey Statement 2 Results

Statement 2, based on ISTE Standard #2 for Educators states: *I seek out opportunities for leadership to support students' empowerment and success and to improve teaching and learning.* Figures 4 and 5 show the perceptions of teachers and students, as it pertains to Statement 2.

Figure 4

Teacher Perception Statement 2 Results

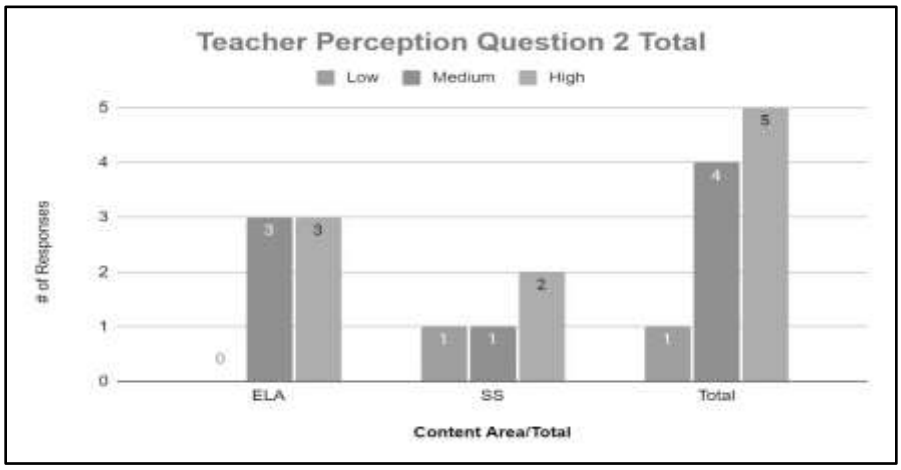
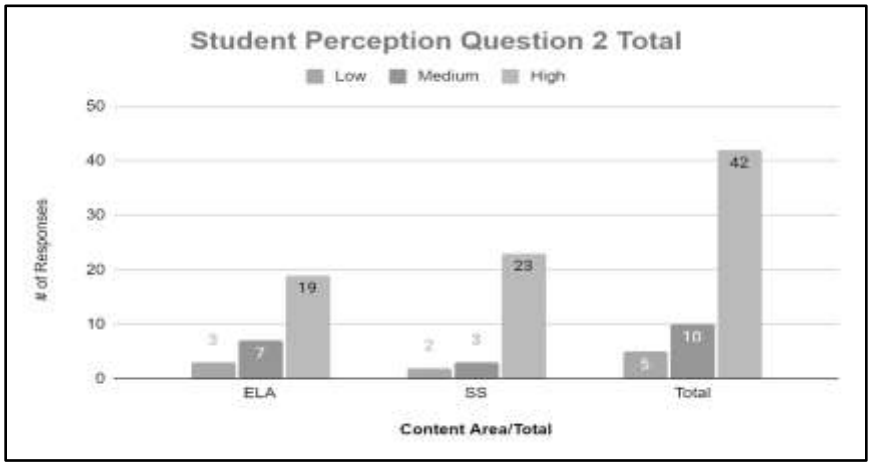


Figure 5

Student Perception Statement 2 Results



There were 10 teacher participants who responded to Statement 2. Six teachers were ELA teachers (n = 6) and four teachers (n = 4) were Social Studies teachers. While three out of six ELA teachers and two out of four Social Studies teachers answered that they viewed seeking leadership opportunities to improve their teaching as a *High* priority, one Social Studies teacher and three ELA teachers felt that they made improving their practice a *Medium* priority, while one Social Studies teacher viewed their efforts as a *Low*

priority. Survey results show that 50% of teachers surveyed believed they succeed at supporting student empowerment to improve their learning,

There were 57 (n = 57) students who responded to Statement 2. Twenty-nine students were ELA students (n = 29) and 28 were Social Studies students (n = 28). While 19 out of 29 ELA students and 23 out of 28 Social Studies students perceived their teachers as those that see the value in seeking out leadership opportunities, seven ELA and three Social Studies students viewed their teacher's commitment to improve their practice as a *Medium* priority, and three ELA students and two Social Studies students perceived their teacher's intent to seek leadership opportunities as a *Low* priority. The student perception survey showed that 76 % of students felt that their teacher did seem to place a focus on the value of leadership opportunities as a means of improving instruction.

Teacher and Student Likert Survey Statement 3 Results

Statement 3, based on ISTE Standard #3 for Educators states, *I inspire students to positively contribute to and responsibly participate in the digital world.* Figures 6 and 7 show the perceptions of teachers and students as it pertains to Statement 3.

Figure 6. Teacher Perception Question 3 Results

Teacher Perception Statement 3 Results

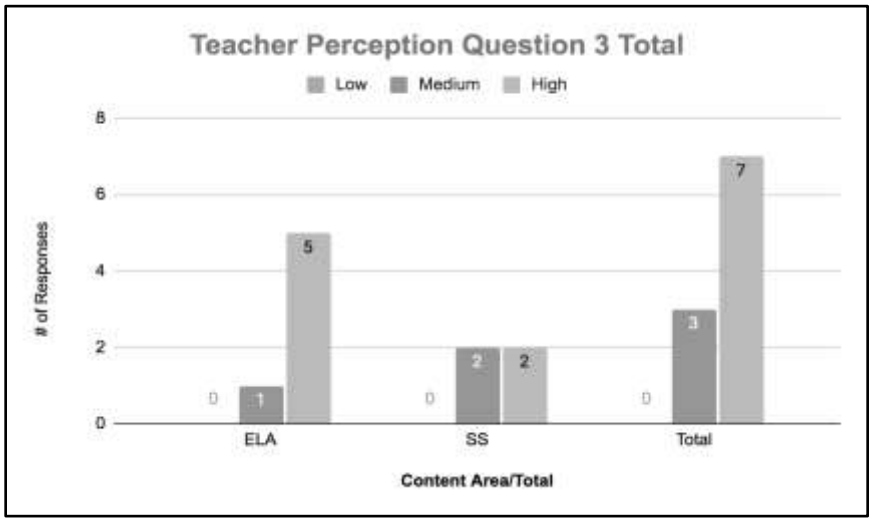
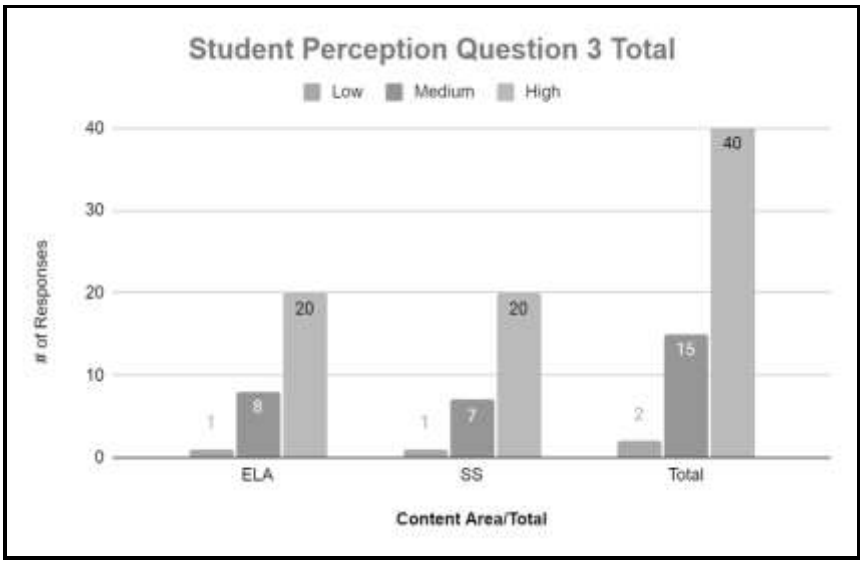


Figure 7

Student Perception Statement 3 Results



There were 10 teacher participants who responded to Statement 3. Six teachers were ELA teachers (n = 6) and four teachers (n = 4) were Social Studies teachers. While five out of six ELA teachers and two out of four Social Studies teachers answered that they viewed inspiring students to responsibly participate in the digital world as a *High*

priority, two Social Studies teachers and one ELA teacher felt that they made improving their practice a *Medium* priority, while none of the teachers viewed their efforts as a *Low* priority.

There were 57 (n = 57) students who responded to Statement 3. Twenty-nine students were ELA students (n = 29) and 28 were Social Studies students (n = 28). While 20 students from each content area perceived their teachers as those that encourage them to engage in the digital world in a responsible manner, eight ELA and seven Social Studies students viewed their teacher's commitment to improve their practice as a *Medium* priority, and one student from both content areas perceived their teachers' focus on this digital engagement as a *Low* priority. Students and teachers both agree that teachers are trying to positively participate in the digital world. Seventy percent of both students and teachers rated the teachers as high in this area.

Teacher and Student Likert Survey Statement 4 Results

Statement 4, based on the ISTE Standard #4 for Educators states: *I dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems.* Figures 8 and 9 show the perceptions of teachers and students, as it pertains to Statement 4.

Figure 8. Teacher Perception Question 4 Results

Teacher Perception Statement 4 Results

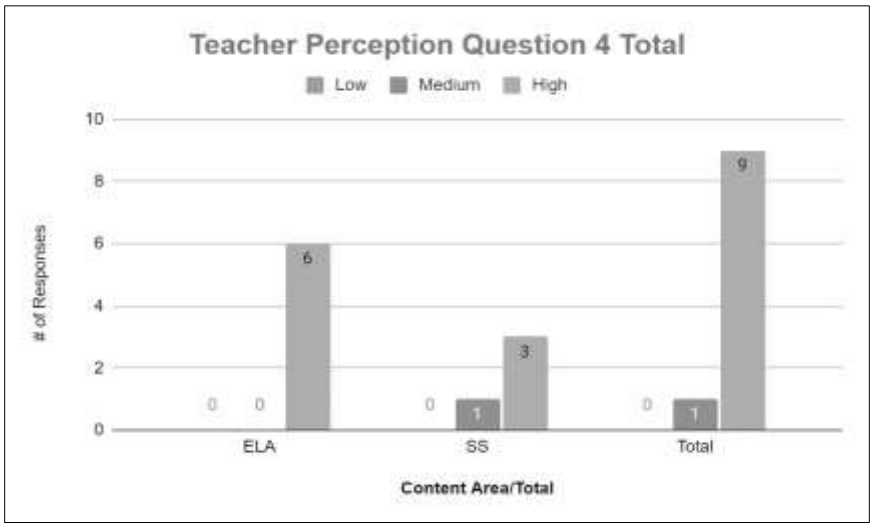
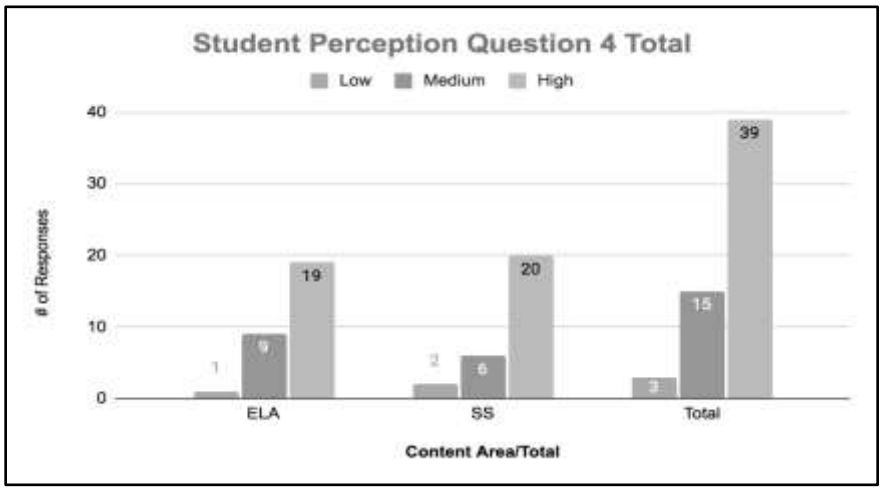


Figure 9

Student Perception Statement 4 Results



There were 10 teacher participants who responded to Statement 4. Six teachers were ELA teachers (n = 6) and four teachers (n = 4) were Social Studies teachers. While all six out of six ELA teachers and three out of four teachers Social Studies answered that they make dedicated time to collaborate with colleagues and students a *High* priority, One Social Studies teacher felt they made dedicated time a *Medium* priority. The

outcome resulted in an overwhelming majority of 90 % of teachers who felt that they do make collaboration time a priority and 10% who felt they make it a medium priority.

There were 57 (n = 57) students who responded to Statement 4. Twenty-nine students were ELA students (n = 29) and 28 were Social Studies students (n = 28). While 20 students from Social Studies and 19 from ELA perceived their teachers as those that valued the power of collaboration, nine ELA and six Social Studies students viewed their teacher's commitment to improve their practice as a *Medium* priority, and two students from Social Studies and one ELA student perceived their teachers' focus on collaboration as a *Low* priority

Teacher and Student Likert Survey Statement 5 Results

Statement 5, based on ISTE Standard #5 for Educators states: *I design authentic, learner-driven activities and environments that recognize and accommodate learner variability*. Figures 10 and 11 show the perceptions of teachers and students, as it pertains to Statement 5.

Figure 10

Teacher Perception Statement 5 Results

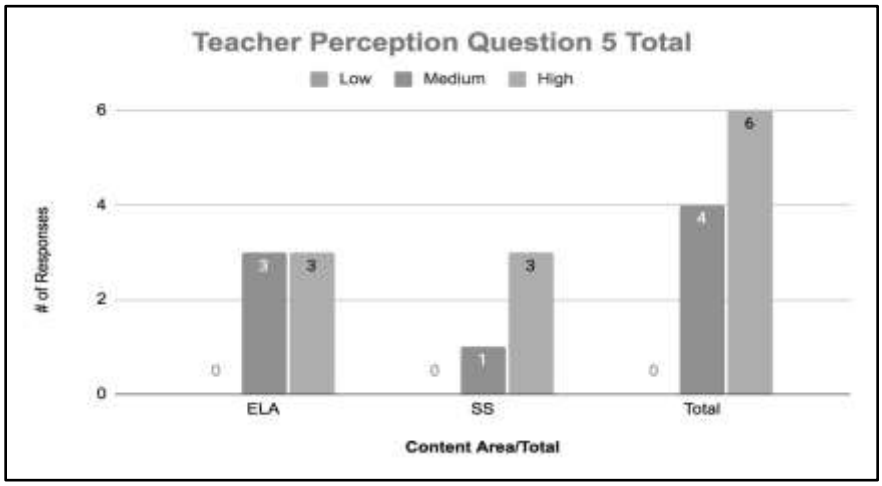
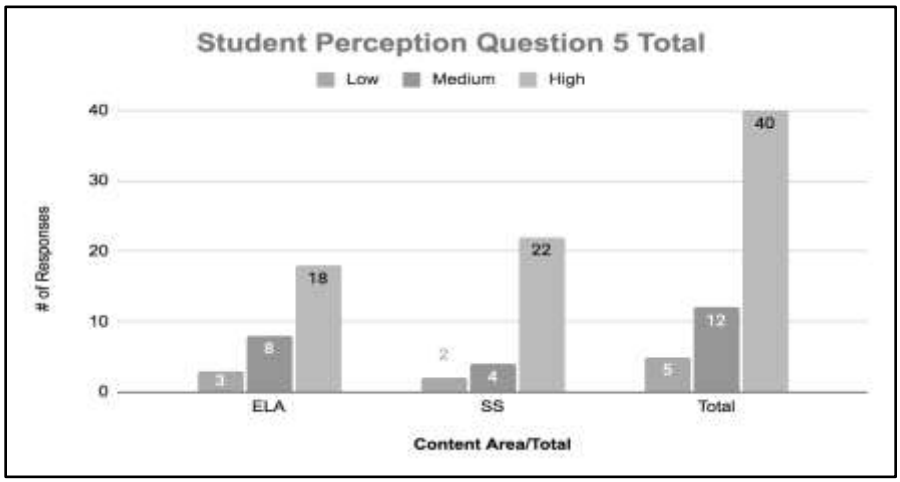


Figure 11. *Student Perception Question 5 Results*

Student Perception Statement 5 Results



There were 10 teacher participants who responded to Statement 5. Six teachers were ELA teachers (n = 6) and four teachers (n = 4) were Social Studies teachers. While half of the ELA teachers surveyed and three out of four Social Studies teachers answered that they viewed designing authentic learning opportunities that value the needs of various learning styles as a *High* priority, one Social Studies teachers and the remaining three ELA teachers felt that they made improving their practice a *Medium* priority, while none of the teachers viewed their efforts as a *Low* priority. Sixty percent of teachers believe that they excel at creating these personalized learning experiences

There were 57 (n = 57) students who responded to Statement 5. Twenty-nine students were ELA students (n = 29) and 28 were Social Studies students (n = 28). While 18 out of the 29 ELA students and 22 of the 28 Social Studies students perceived their teachers as those that focus on designing authentic lessons, eight ELA and four Social Studies students viewed their teacher's commitment to improve their practice as a *Medium* priority, and three ELA and 2 Social Studies students perceived their teachers' focus creating these learner-driven activities as a *Low* priority. Seventy percent of

students seem to agree that their teachers are focused on designing these authentic learning experiences.

Teacher and Student Likert Survey Statement 6 Results

Statement 6, based on ISTE Standard #6 for Educators, states*: I facilitate learning with technology to support student achievement of the 2016 ISTE Standards for Students*. Figures 12 and 13 show the perceptions of teachers and students as it pertains to Statement 6.

Figure 12

Teacher Perception Statement 6 Results

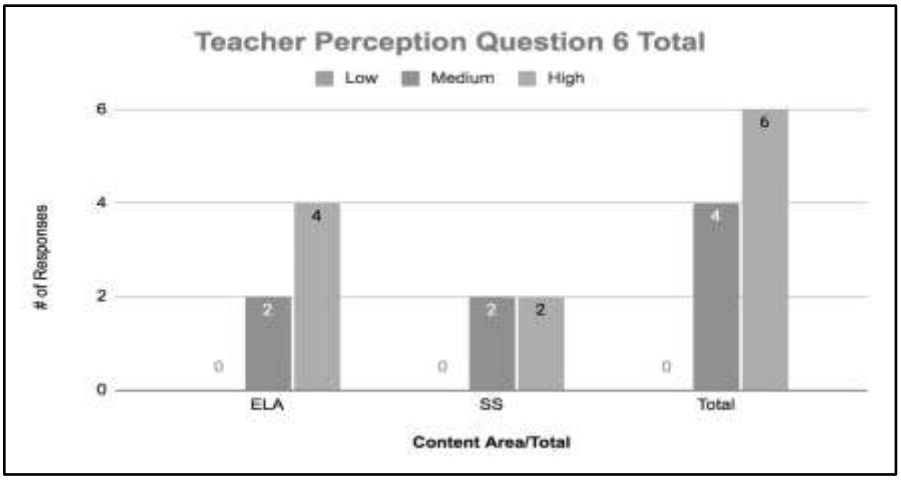
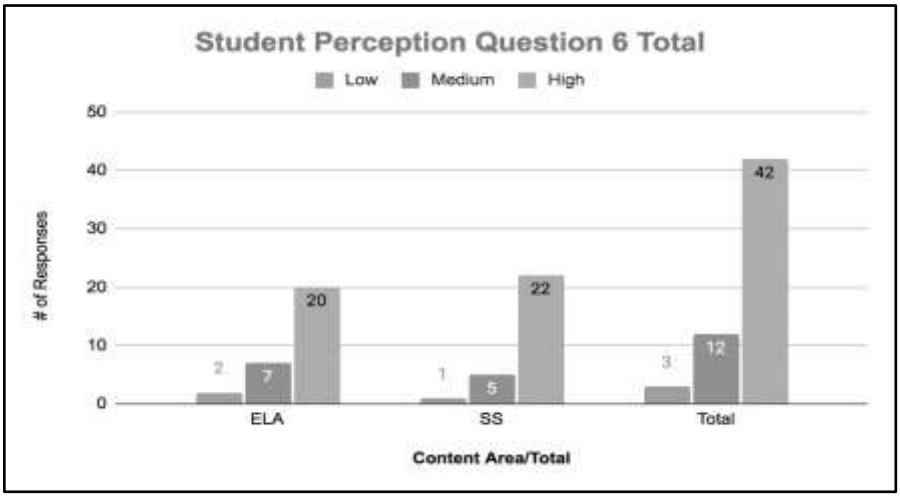


Figure 13

Student Perception Statement 6 Results



There were 10 teacher participants who responded to Statement 6. Six teachers were ELA teachers (n = 6) and four teachers (n = 4) were Social Studies teachers. While half of Social Studies teachers and four out of six ELA teachers surveyed answered that they feel that they do facilitate learning with technology to improve student learning as a *High* priority, the remaining half of the Social Studies teachers and two ELA teachers felt that they made improving their practice a *Medium* priority, while none of the teachers viewed their efforts as a *Low* priority. Survey results show that 60 % of teachers feel comfortable with the focusing on the ISTE Standards for Students.

There were 57 (n = 57) students who responded to Statement 6. Twenty-nine students were ELA students (n = 29) and 28 were Social Studies students (n =28). While 20 out of the 29 ELA students and 22 of the 28 Social Studies students perceived their teachers as those that facilitate technology use to enhance student learning, seven ELA students and five Social Studies students viewed their teacher's commitment facilitating tech use as a *Medium* priority, and two ELA students and one Social Studies student

perceived their teachers' commitment to using technology to increase student learning as a *Low* priority. Seventy-four percent of students view their teachers as competent of the ISTE standards.

Teacher and Student Likert Survey Statement 7 Results

Statement 7, based on ISTE Standard #7 for Educators, states: *I understand and use data to drive their instruction and support students in achieving their learning goals*. Figures 14 and 15 show the perceptions of teachers and students as it pertains to Statement 7.

Figure 14

Teacher Perception Question 7 Results

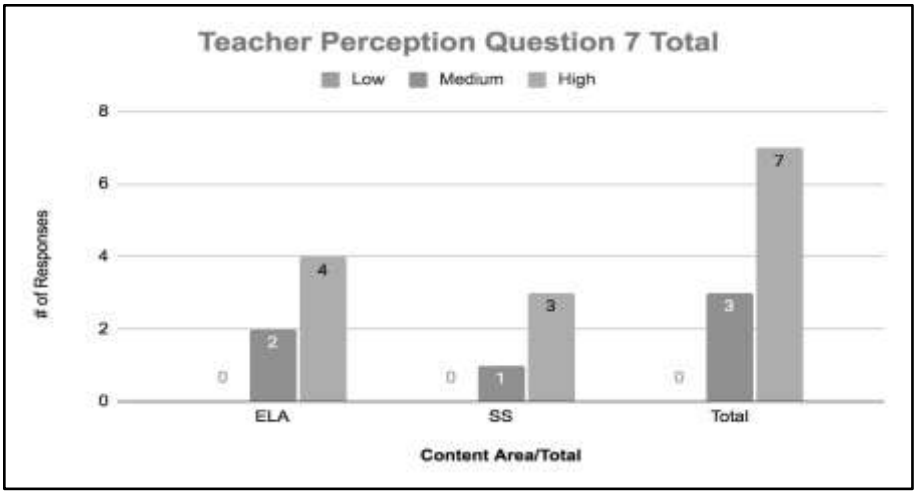
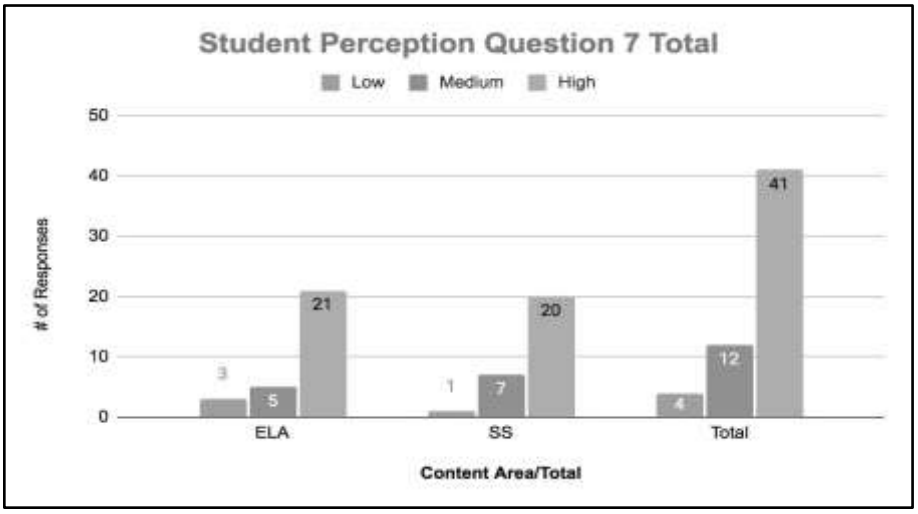


Figure 15

Student Perception Statement 7 Results



There were 10 teacher participants who responded to Statement 7. Six teachers were ELA teachers (n = 6) and four teachers (n = 4) were Social Studies teachers. While three of four Social Studies teachers and four out of six ELA teachers surveyed answered that they feel that they do understand data analysis and how to use it to improve student learning as a *High* priority, one Social Studies teacher and two ELA teachers felt that they made data analysis a *Medium* priority, while none of the teachers viewed their efforts as a *Low* priority. Seventy percent of teachers seem to feel that they excel at using data to drive instruction.

There were 57 (n = 57) students who responded to Statement 7. Twenty-nine students were ELA students (n = 29) and 28 were Social Studies students (n = 28). While 21 out of the 29 ELA students and 20 of the 28 Social Studies students perceived their teachers as those that seem to understand how to effectively use data analysis to increase student learning, five ELA students and seven Social Studies students viewed their teacher's commitment facilitating tech use as a *Medium* priority, and three ELA students

and one Social Studies student perceived their teachers' commitment to using data to increase student learning as a *Low* priority. Seventy-two percent of students perceive their teacher to use data to support them in their academic achievement.

Research Question 2 (Teacher) Results

RQ2 - What are the thoughts of teachers as it pertains to the factors that affect student achievement during the Covid-19 Pandemic?

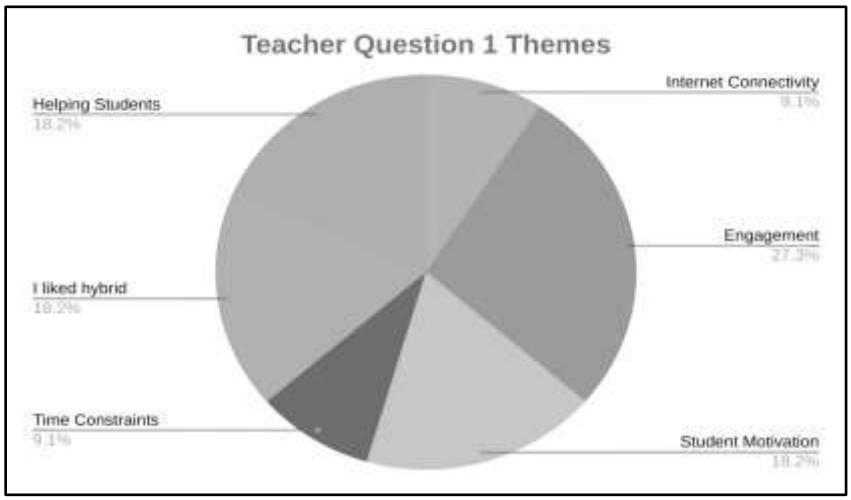
The qualitative portion of this study also used a *Qualtrics*-created survey with a select group (volunteers) of teachers and students to gain their perspective on teacher digital proficiencies. To gain qualitative data, a questionnaire consisting of 11 open-ended questions for teachers and 10 open-ended questions for students that focused on the participants' view on education during the global pandemic was used. Eight students and 10 teachers participated in this voluntary survey. This data was collected to analyze Research Question 2. This qualitative data was collected by utilizing the *Qualtrics* software instrument required by the research university (see Appendix C).

Teacher Open-Ended Survey Question 1 Results

Question 1 of the teacher survey focused on the biggest challenge for educators during the time of hybrid instruction, as seen in Figure 16.

Figure 16

Teacher Open-Ended Survey Question 1 Results



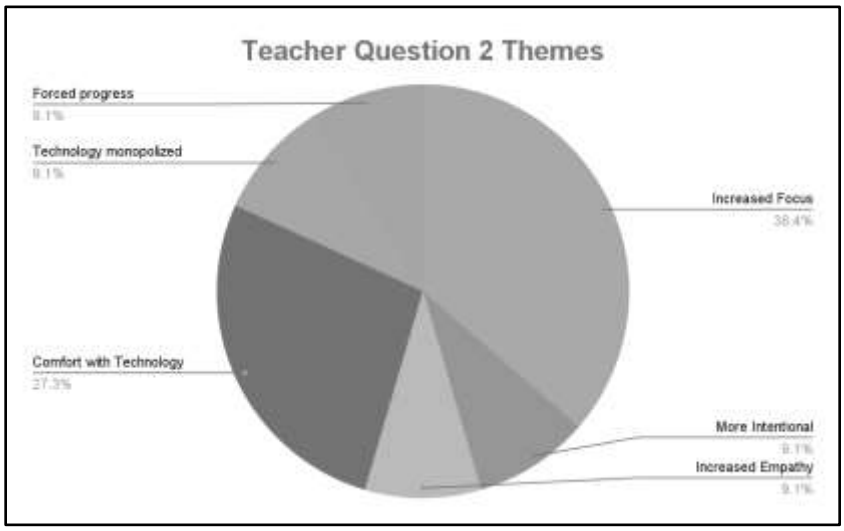
While the majority of teachers surveyed, 27.3% felt that the biggest challenge of hybrid instruction was engaging students, two other factors of this learning approach that proved to be a challenge for teachers include helping students and keeping students motivated. The same number of teachers that struggled with those challenges, also stated that they liked the hybrid instructional approach.

Teacher Open-Ended Survey Question 2 Results

Question 2 explores how being forced to use the hybrid instructional approach changed teachers, as seen in Figure 17.

Figure 17

Teacher Open-Ended Survey Question 2 Results



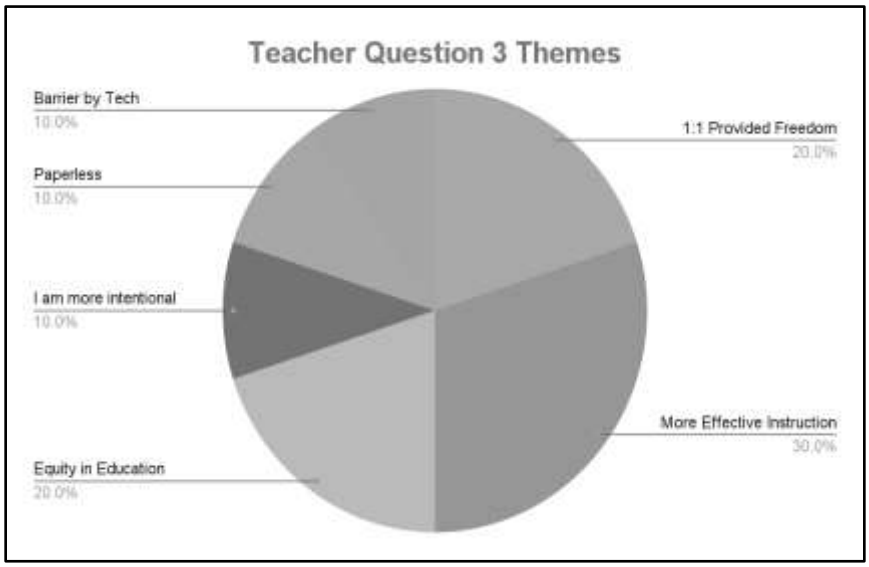
Just over 36% of teachers surveyed stated that using a hybrid instructional approach forced them to use increased focus as they were analyzing their lessons and choosing what standards deserved more attention. While others noted that they became more comfortable with technology, the remaining results were the same, which included going hybrid forced teachers to move forward and change, others felt that the push to use technology monopolized their time, others stated they were more intentional in making decisions about their instruction, and some teachers surveyed noted that the new instructional approach resulted in an increased sense of empathy for the students.

Teacher Open-Ended Survey Question 3 Results

In question 3, teachers were asked to share how going 1:1 changed their teaching, as seen in Figure 18.

Figure 18

Teacher Open-Ended Survey Question 3 Results



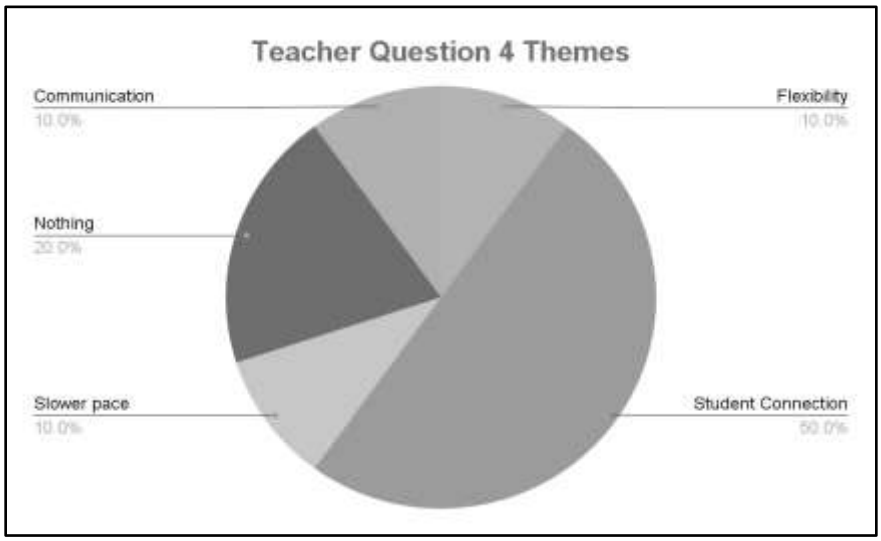
The majority of teachers surveyed believed that going 1:1 resulted in more effective instruction, with others who felt that this change provided more freedom as they were not bound to paper copies, and others hoped that going 1:1 provided more equity in education.

Teacher Open-Ended Survey Question 4 Results

Question 4 focuses on what educators missed most about the traditional approach to instruction, as seen in Figure 19.

Figure 19

Teacher Open-Ended Survey Question 4 Results



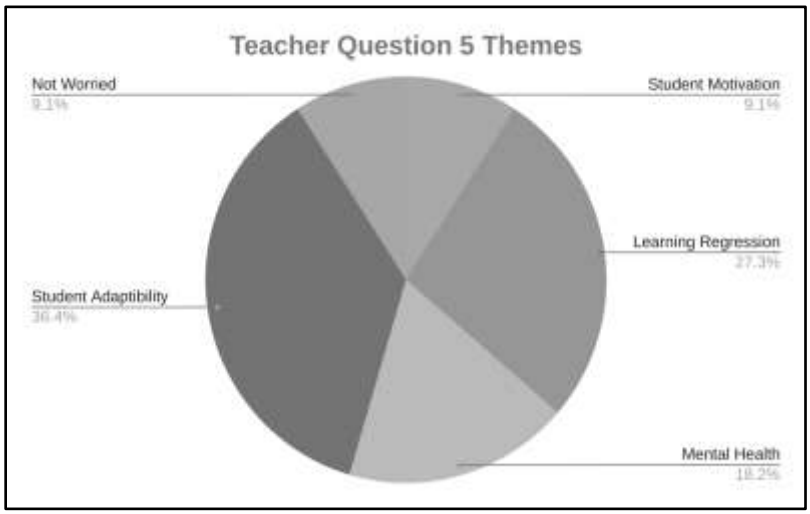
Half of the teachers surveyed shared that they missed the opportunities to make meaningful student connections that they felt were more present in a traditional seated model, as opposed to the hybrid instructional approach.

Teacher Open-Ended Survey Question 5 Results

In question 5, teachers opened up about their biggest worry for students during the Covid-19 Pandemic, as seen in Figure 20.

Figure 20

Teacher Open-Ended Survey Question 5 Results



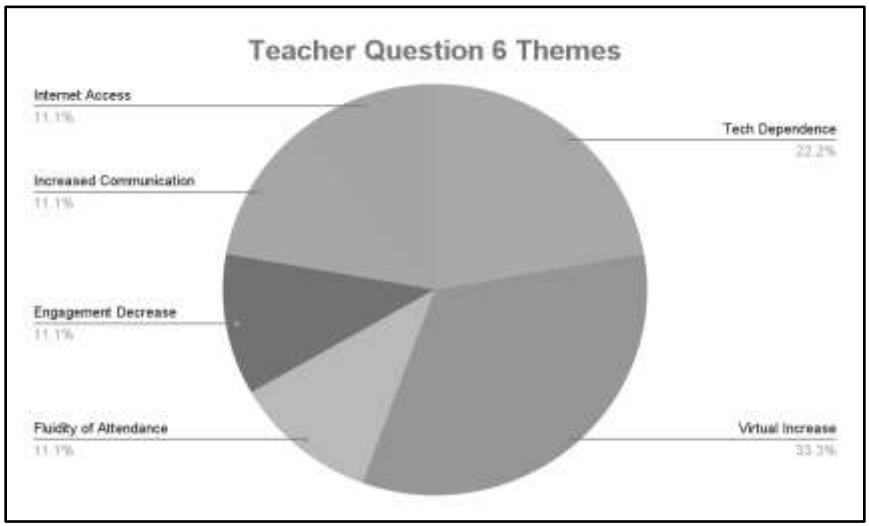
When asked about their biggest worry for students during the pandemic, most teachers surveyed discussed their fear of students struggling to adapt to the new learning environment and all the challenges that accompanied the change.

Teacher Open-Ended Survey Question 6 Results

Question 6 asked teachers if they believe the pandemic changed education forever. Eight educators believe that Covid-19 has changed the face of education, while one reported no. Teachers also expanded on their beliefs on this question, as seen in Figure 21.

Figure 21

Teacher Open-Ended Survey Question 6 Results



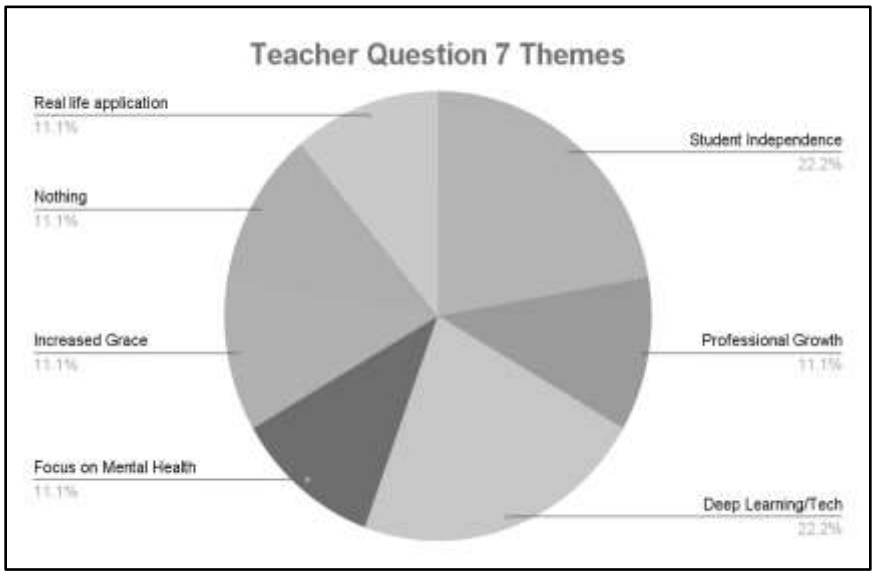
The largest percentage of teachers surveyed shared their belief that one change that occurred due to Covid, that they believe will now be a constant in education is the presence of virtual learning, in some manner.

Teacher Open-Ended Survey Question 7 Results

Question 7 focuses on the educational benefits that educators believe are a result of the Covid-19 Pandemic, as seen in Figure 22.

Figure 22

Teacher Open-Ended Survey Question 7 Results



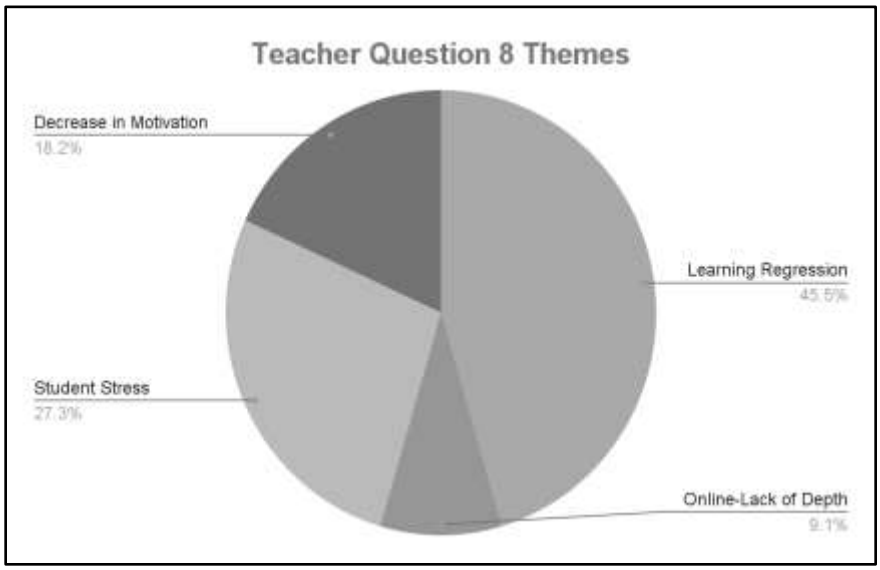
Concerning thoughts about any educational benefits that they believed were a direct result of the Covid-19 pandemic, teachers' responses were close, however the two topics that emerged as common themes included the idea that the pandemic forced students to become more independent learners by realizing they do not need to rely so heavily on teachers and the deep learning opportunity that the global pandemic presented to both teachers and students.

Teacher Open-Ended Survey Question 8 Results

Next, teachers explain what educational tragedies they believe have emerged due to Covid-19, as seen in Figure 23.

Figure 23

Teacher Open-Ended Survey Question 8 Results



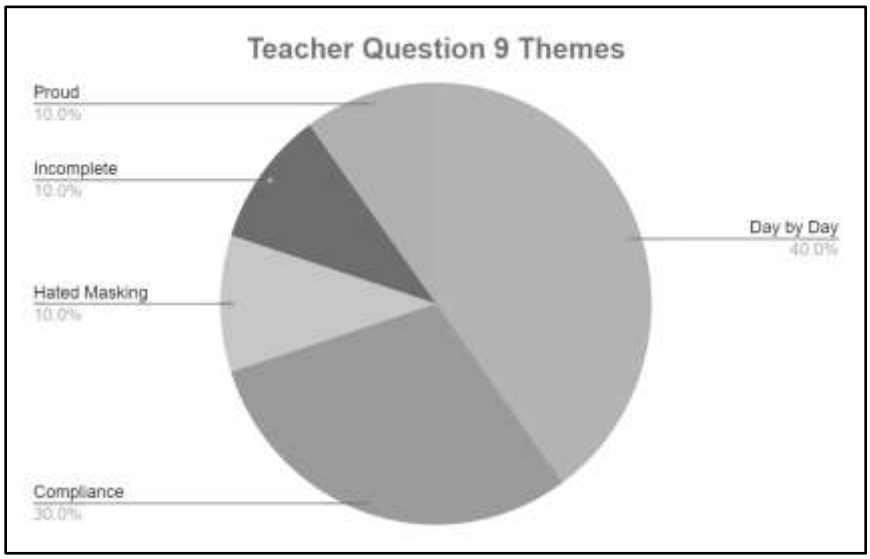
Almost half of the teachers surveyed shared their concern that a major tragedy that emerged from the pandemic is the idea of student learning regression that they feel students experienced due to the change in instructional approach.

Teacher Open-Ended Survey Question 9 Results

Teachers then shared their perception of how they handled teaching during a global pandemic in question 9, as seen in Figure 24.

Figure 24

Teacher Open-Ended Survey Question 9 Results



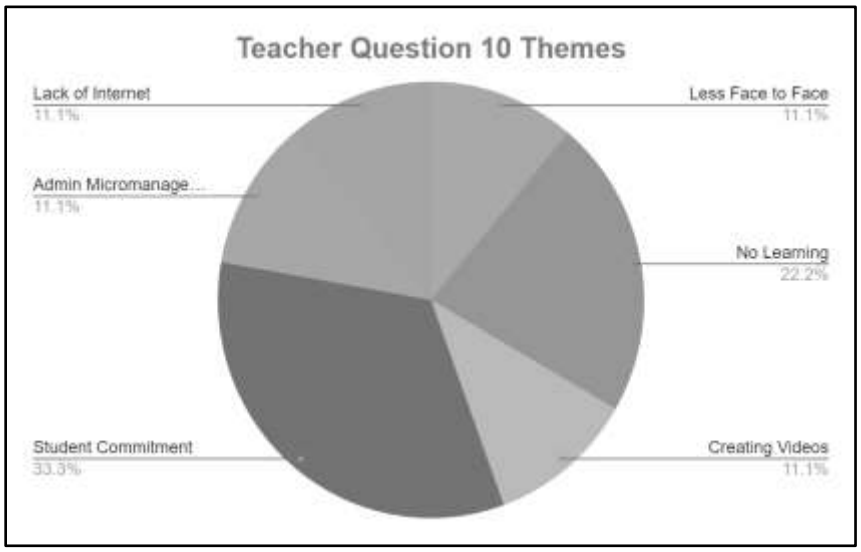
Forty percent of teachers surveyed explained that they felt that they had to handle things in a day-by-day manner during the pandemic because of the fact that hybrid was a new concept to them, student and teacher quarantines were always an issue, and things changed daily, and they simply did their best to keep up.

Teacher Open-Ended Survey Question 10 Results

Question 10 asked teachers to share their concerns about hybrid/online teaching, as seen in Figure 25.

Figure 25

Teacher Open-Ended Survey Question 10 Results



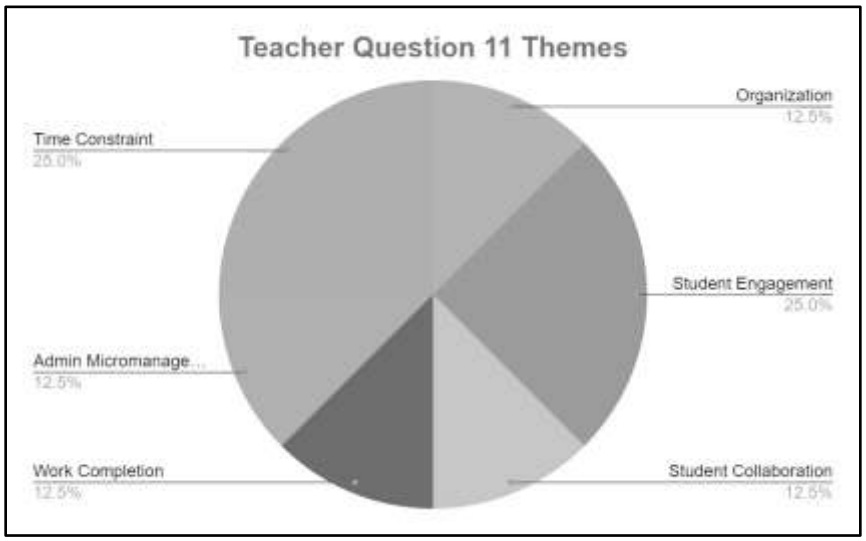
The lack of student commitment to learning in a hybrid setting was the main concern as it pertained to hybrid/online teaching for those surveyed.

Teacher Open-Ended Survey Question 11 Results

Finally, teachers were asked to discuss the challenges of moving classes online in question 11, as seen in Figure 26.

Figure 26

Teacher Open-Ended Survey Question 11 Results



According to teachers surveyed, there were many challenges to moving classes online, but the challenge that appeared the most in responses was the amount of time it took to create meaningful and engaging online lessons for students.

Research Question 2 (Student) Results

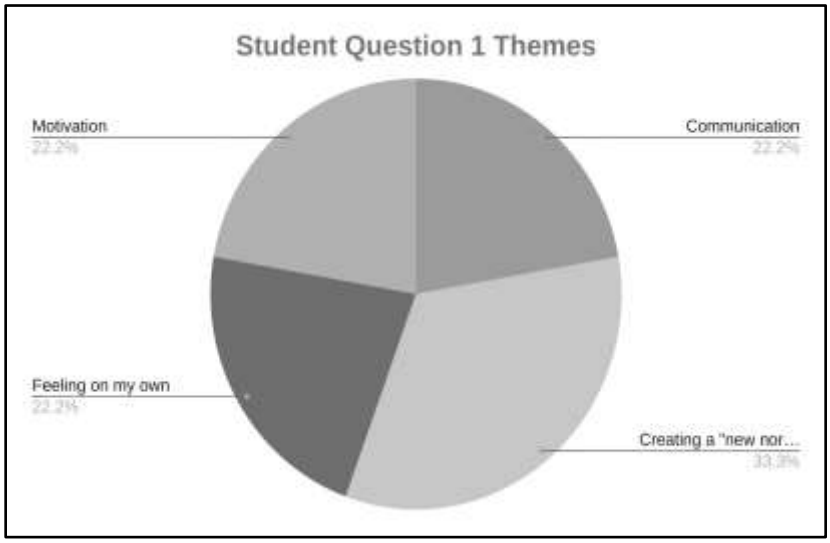
RQ2 - What are the thoughts of students as it pertains to the factors that affect student achievement during the Covid-19 Pandemic?

Student Open-Ended Survey Question 1 Results

Question 1 of the Student Survey focused on the challenges that students faced during the time of hybrid learning, as seen in Figure 27.

Figure 27

Student Open-Ended Survey Question 1 Results



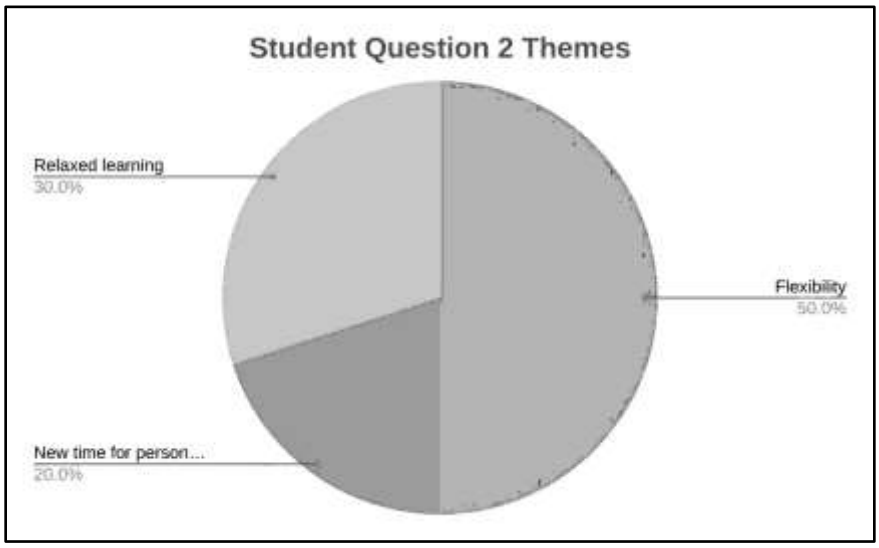
The idea of creating a *new normal* was recognized as the biggest challenge for students as they transitioned to hybrid learning. The remaining themes were evenly divided among the responses: a lack of motivation, the struggle to stay in communication with the teacher, and feeling that they (students) were all on their own in this process.

Student Open-Ended Survey Question 2 Results

Question 2 asked students to identify what they liked about the hybrid schedule, as seen in Figure 28.

Figure 28

Student Open-Ended Survey Question 2 Results



. Half of students surveyed, shared their appreciation for the flexibility that the hybrid learning approach provided to them. Being able to work according to their own schedule and the ability to add hours to their jobs were a pro for students during this time of hybrid instruction.

Student Open-Ended Survey Question 3 Results

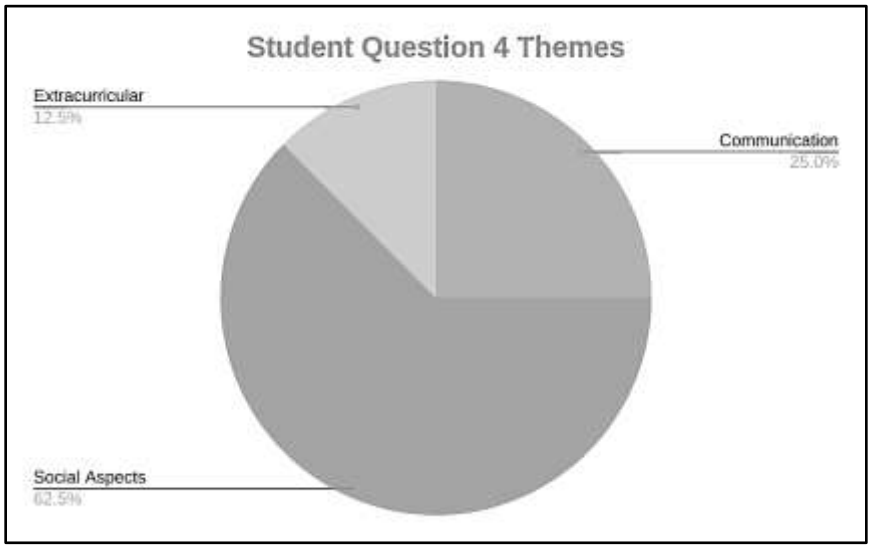
In question 3, students share how they feel going 1:1 changed their education, however, the researcher concluded that students didn't understand the term "1:1" and were confusing it with hybrid, making that research question void.

Student Open-Ended Survey Question 4 Results

Question 4 focused on what students miss most about the traditional school setting, as seen in Figure 29.

Figure 29

Student Open-Ended Survey Question 4 Results



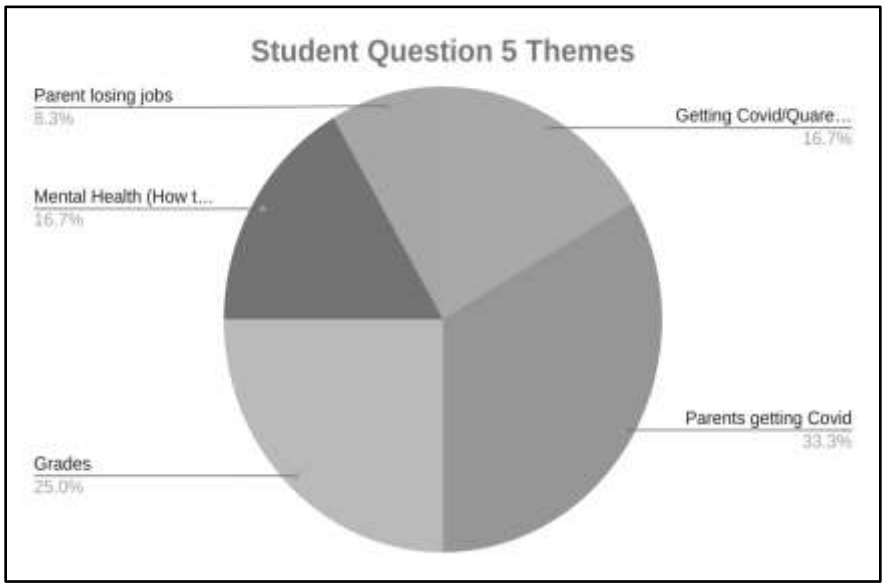
An overwhelming 62.5 % of students surveyed noted that they missed the social aspects of the traditional learning model. Specifics such as talking with teachers and the absence of friendships were a struggle for students at this time.

Student Open-Ended Survey Question 5 Results

For question 5, students opened up about their biggest worry during the global pandemic, as seen in Figure 30.

Figure 30

Student Open-Ended Survey Question 5 Results



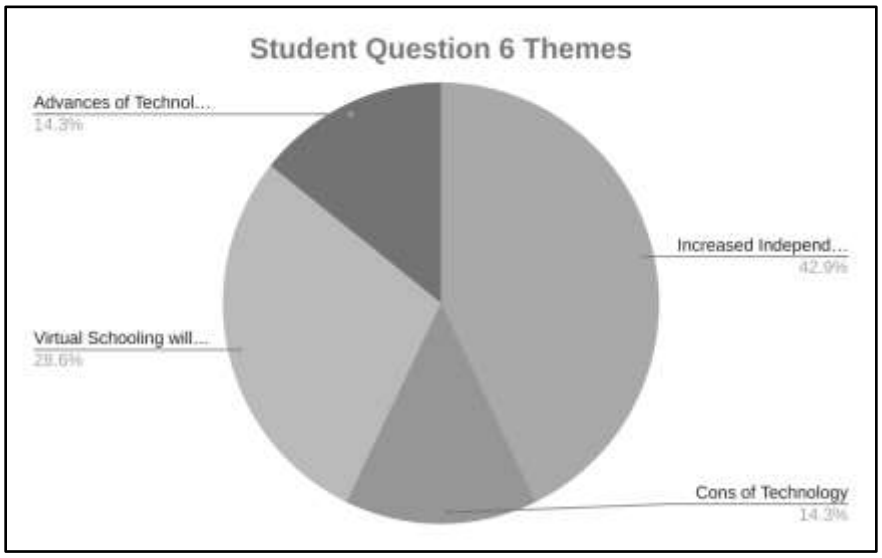
While the majority of students worried about their parents contracting Covid-19, many students were also struggled with how to keep their grades up at this time.

Student Open-Ended Survey Question 6 Results

Question 6 asked students if they believe the pandemic changed education forever. Six students believe that Covid-19 has changed the face of education, while one student reported no. Students also shared their thoughts on what education will look like in the future, as seen in Figure 31.

Figure 31

Student Open-Ended Survey Question 6 Results



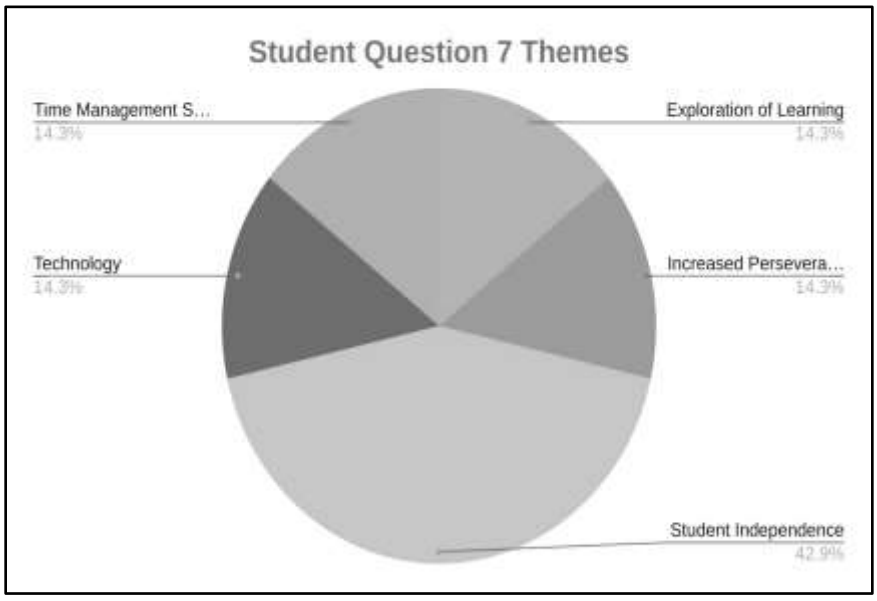
The majority of students surveyed agreed that the Covid-19 pandemic has changed education forever and 42.9% of those students stated that the increased independence that the pandemic presented to students is something that they believe will be a constant now in public education.

Student Open-Ended Survey Question 7 Results

Students shared the educational benefits they believe resulted from Covid in question 7, as seen in Figure 32.

Figure 32

Student Open-Ended Survey Question 7 Results



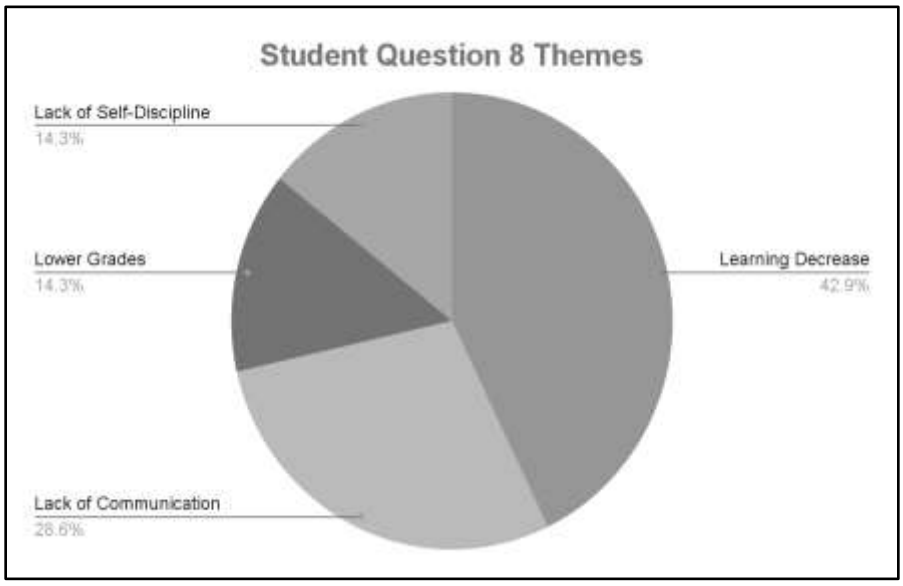
As it appeared in other questions, the student appreciation for independence was recognized as the main education benefit that they believe resulted from the Covid-19 pandemic.

Student Open-Ended Survey Question 8 Results

Next, question 8 explored the tragedies that students believe emerged from the pandemic, as seen in Figure 33.

Figure 33

Student Open-Ended Survey Question 8 Results



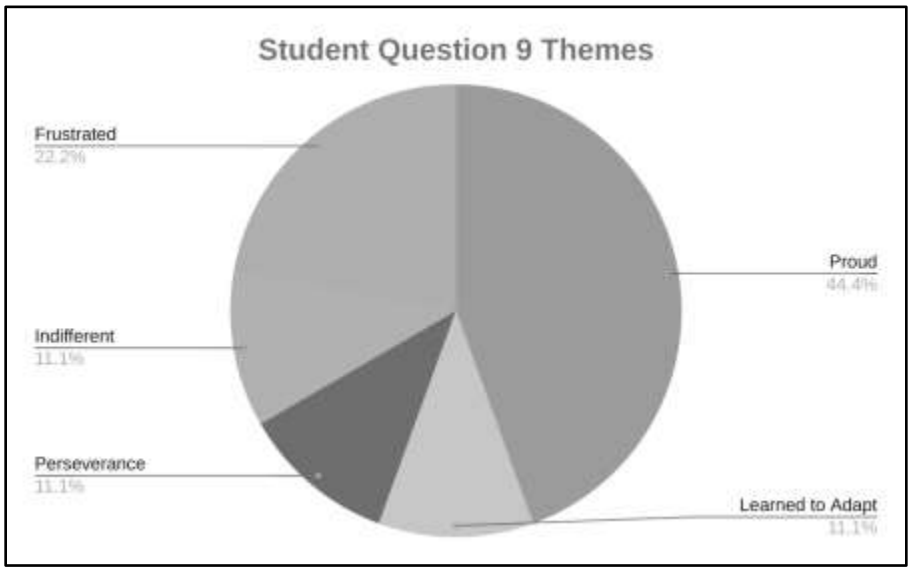
When asked about any tragedies that they believe resulted due to the pandemic, the majority of students shared their belief that a decrease in learning was definitely an unfortunate side effect of the hybrid learning approach.

Student Open-Ended Survey Question 9 Results

Question 9 asked students to share their perception of how they dealt with schooling during a global pandemic, as seen in Figure 34.

Figure 34

Student Open-Ended Survey Question 9 Results



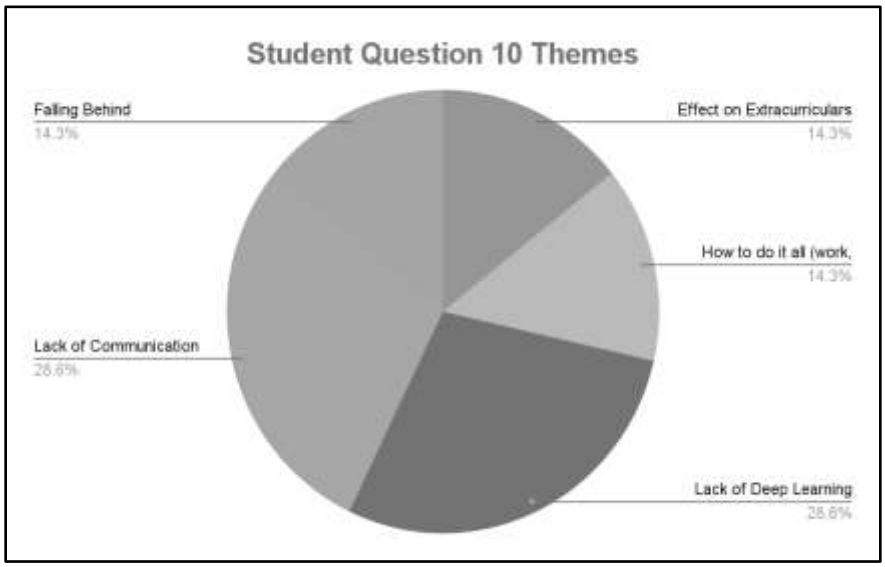
While some students shared that they felt frustrated with how they handled schooling during the pandemic due to factors such as a lack of motivation, the majority of students recognized that they were proud of how they were able to adapt to the situation and challenges that the pandemic presented.

Student Open-Ended Survey Question 10 Results

The final question of the student survey asked students to share their biggest concern about hybrid/online learning, as seen in Figure 35.

Figure 35

Student Open-Ended Survey Question 10 Results



The lack of communication that resulted due to the new hybrid learning approach was listed as the main challenge by those students that participated in the survey.

Null Hypothesis 1.A and 1.B Results

The TUPS (2020) Survey was used to measure teacher perception of technology. This data collection instrument was a part of the TIMS Tool Suite (n.d.) and revealed teachers' beliefs of the role of technology in the classroom, confidence level of using technology, and knowledge of digital proficiency (see Appendix D). While 14 teachers completed the survey, only results from six teachers were used because the study aimed to connect the perceptions of teachers to students' 2021 English II and Government EOC scores, therefore data from those two courses were used. The researcher focused on the responses from three English II teachers and three Government teachers. Of those six teachers, four were female, two were male, two were in the first three years of their

career, two had taught 10 to 20 years, and the final two had taught more than 20 years. Refer to Table 3 to review TUPS category labels.

$NH_0$1.A.1 Results

$NH_0$1.A.1 - There is no difference in students' 2021 Government EOC scores based on the teachers' comfort and confidence levels with technology.

Table 7

$NH_0$1.A.1 Government Results Comfort Level ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	22.82	2	11.41	27.76	$p < .001$	3.045
Within Groups	75.22	183	0.41			
Total	98.04	185				

An Analysis of Variance (ANOVA) was conducted to determine whether or not the teachers' comfort and confidence level with technology had a significant effect on students' 2021 Government EOC scores, as seen in Table 7. The analysis revealed there was a significant difference. The Null was rejected, and it was concluded that the 2021 Government EOC scores were different. A Scheffe' test was conducted to determine where differences existed, which compared the means for each comfort level range as displayed in Table 7. To obtain the EOC means, EOC scores were gathered for each student and grouped by their Government teacher. Those scores were averaged, which provided the EOC mean for each Comfort and Confidence Range, as seen in Table 8. There were no teachers who perceived their Comfort and Confidence Level as Low or Medium High.

Table 8

Comfort Level Government EOC Compared Means

Ranges	Comfort Level Means
Low	*
Medium Low	2.24
Average	3
Medium High	*
High	2.16

Table 9

$NH_0$1.A.1 Government Comfort Level PostHoc Analysis

Scheffé Test	Fs	Fcrit	Sig?
Medium Low vs. *Average*	49.06	6.091	Yes
Medium Low vs. High	0.43	6.091	No
Average vs. High	36.59	6.091	Yes

A Scheffe' Post-hoc analysis, as seen in Table 9, concluded that when teachers' means who had a Medium Low Comfort and Confidence level (M = 2.24) with technology were compared to teachers' means who had an Average Comfort and Confidence level (M = 3.00), the researcher rejected the Null and supported the alternative hypotheses that there was a difference that was considered significant with a confidence level of 95% that the results were not due to chance.

The Scheffe' Post-hoc analysis also concluded that when teachers' means who had a Medium Low Comfort and Confidence level (M = 2.24) with technology were compared to teachers' means who had a High Comfort and Confidence level (M = 2.16), the researcher failed to reject the Null and recognized that there were no statistically significant difference the EOC means of the two confidence levels.

The final result from the Scheffe' Post-hoc analysis concluded that when teachers' means who had an Average Comfort and Confidence level (M = 3) with technology were compared to teachers' means who had a High Comfort and Confidence level (M = 2.16), the researcher rejected the Null and supported the alternative hypotheses that there was a difference that was considered significant with a confidence level of 95% that the results were not due to chance

The overall results indicated that teachers' who had an average Comfort and Confidence level with technology had a higher mean that was considered significant when compared to all other confidence level ranges.

$NH_0$1.A.2 Results

$NH_0$1.A.2 - There is no difference in students' 2021 Government EOC scores based on teachers' perceptions of their technology use.

Table 10

$NH_0$1.A.2 Government Results Technology Use ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	22.82	2	11.41	27.76	p < .001	3.045
Within Groups		75.22	183	0.41		
Total	98.04	185				

An Analysis of Variance (ANOVA) was conducted to determine whether or not the teachers' perception of their technology use had a significant effect on students' 2021 Government EOC scores. The analysis, as seen in Table 10, revealed there was a significant difference. The Null was rejected, and it was concluded that the 2021 Government EOC scores were different. A Scheffe' test was conducted to determine where differences existed, which compared the means for each Technology Use range, as

displayed in Table 10. To obtain the EOC means, EOC scores were gathered for each student and grouped by their Government teacher. Those scores were averaged, which provided the EOC mean for each Technology Use Range, as displayed in Table 11. There were no teachers who perceived their Technology Use Level as Low or Medium High.

Table 11. Technology Use Government EOC Compared Means

Technology Use Government EOC Compared Means

Ranges	Comfort Level Means
Low	*
Medium Low	2.16
Average	2.24
Medium High	*
High	3

Table 12

$NH_0$1.A.2 Government Tech Use PostHoc Analysis

Scheffé Test	Fs	Fcrit	Sig?
Medium Low vs. Average	0.43	6.091	No
Medium Low vs. High	36.59	6.091	Yes
Average vs. High	49.06	6.091	Yes

A Scheffe Post-hoc analysis concluded that when teachers' means who had a Medium Low Technology Use level (M = 2.16) were compared to teachers' means who had an Average Technology Use level (M = 2.24), the researcher supported the Null and recognized that there was no statistically significant difference between the EOC means of students that were grouped by their teachers' Technology Use level.

The Scheffe Post-hoc analysis also concluded that when teachers' means who had a Medium Low Technology Use level (M = 2.16) were compared to teachers' means who had a High Technology Use level (M = 3), the researcher rejected the Null and supported

the alternative hypotheses that there was a difference that was considered significant with a confidence level of 95% that the results were not due to chance.

The final portion of the Scheffe' Post-hoc analysis concluded that when teachers' means who had an Average Technology Use level (M = 2.24) were compared to teachers' means who had a High Technology Use level (M = 3), the researcher rejected the Null and supported the alternative hypotheses that there was a difference that was considered significant with a confidence level of 95% that the results were not due to chance.

The overall results, as seen in Table 12 indicated that teachers who had a High level of Technology Use had a higher mean that was considered significant when compared to all other Technology Use level ranges.

$NH_0$1.A.3 Results

$NH_0$1.A.3 - There is no difference in students' 2021 Government EOC scores based on teachers' perceptions of their technology integration.

Table 13

$NH_0$1.A.3 Government Results Two-Sample, t-Test Assuming Equal Variances

Government	*Every Day*	*Several Times/Week*
Mean	3.00	2.22
Variance	0.30	0.38
Observations	48	161
Pooled Variance	0.36	
Hypothesized Mean Difference	0	
df	207	
t Stat	7.89	
P(T<=t) one-tail	p < .001	
t Critical one-tail	1.65	
P(T<=t) two-tail	p < .001	
t Critical two-tail	1.97	

A Two-Sample, *t*-Test of independent means was conducted to see if the students whose teachers integrated technology everyday were higher than the scores of students whose teachers integrated it several times a week, as shown in Table 13. A preliminary test of variances revealed that the variances were equal. The *t*-Test analysis with equal variances revealed that the scores for Government students whose teachers integrated technology everyday (M = 3.00, SD = 0.55) were significantly higher than those of Government students' scores of teachers who integrated technology several times a week (M = 2.22, SD = 0.62); $t(207) = 7.89$, $p < .001$. The Null hypothesis was rejected, and it was concluded that the Government students' EOC scores whose teachers integrated technology every day were significantly different than students whose teachers integrated technology several times a week, at a 95% confidence level that was not due to chance.

$NH_0$1.B.1 Results

There is no difference in students' 2021 English II EOC scores based on teachers' perceptions of their confidence and comfort of technology.

Table 14

$NH_0$1.B.1 English II Comfort Level Results Two-Sample, t-Test Assuming Equal Variances

	Avg. Med High	*Avg*
Mean	2.78	2.86
Variance	0.50	0.44
Observations	110	81
Pooled Variance	0.48	
Hypothesized Mean Difference	0	
df	189	
t Stat	0.81	
P(T<=t) one-tail	0.21	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.42	
t Critical two-tail	1.97	

Table 14 shows that a two-sample, *t*-Test of independent means was conducted to see if the student scores, whose teachers had a Medium-High level of Comfort and Confidence with technology were higher than the scores of students whose teacher had an Average level of Comfort and Confidence. A preliminary test of variances revealed that variances were equal. The *t*-Test analysis with equal variances revealed that the scores for students whose teacher had a Medium High Level of Comfort and Confidence (M = 2.78, SD = 0.71) were not significantly higher than those of English II students' scores whose teachers had an Average Level of Comfort and Confidence (M = 2.78, SD = 0.67); $t(189) = 0.81$, $p = .042$. The researcher failed to reject the null and concluded that English II students' EOC scores were not affected by the Comfort and Confidence Level their teachers experienced with technology.

$NH_0$1.B.2 Results

There is no difference in students' 2021 English II EOC scores based on teachers' perceptions of their technology use.

Table 15

$NH_0$1.B.2 English II Technology Use Results Two-Sample, t-Test Assuming Equal Variances

English II EOC	*Med - High*	*Average*
Mean	2.86	2.78
Variance	0.44	0.5
Observations	81	110
Pooled Variance	0.48	
Hypothesized Mean Difference	0	
df	189	
t Stat	0.81	
P(T<=t) one-tail	0.21	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.42	
t Critical two-tail	1.97	

A two-sample, *t*-Test of independent means, as displayed in Table 15, was conducted to see if the student scores, whose teacher had a Medium High level of their perception of their own Technology Use were higher than the scores of students whose teacher had an Average level of perception of their own Technology Use. A preliminary test of variances revealed that variances were equal. The Two-Sample, *t*-Test of Independent Means with equal Variances revealed that the scores for students whose teacher had a Medium High Level of Technology Use (M = 2.78, SD = 0.71) were not significantly higher than those of English II students' scores of teachers who had an Average Level of Technology Use (M = 2.86, SD = 0.67); $t(189) = 0.81$, $p = 0.42$. The

researcher failed to reject the null and concluded that English II students' EOC scores were not affected by the Technology Use Level of their teachers.

$NH_0$1.B.3 Results

There is no difference in students' 2021 English II EOC scores based on teachers' perceptions of their technology integration.

Table 16

$NH_0$1.B.3 English II Technology Integration Results Two-Sample, t-Test Assuming Equal Variances

English II EOC	*1 time a month or less*	*1 time a week*
Mean	2.86	2.78
Variance	0.44	0.5
Observations	81	110
Pooled Variance	0.48	
Hypothesized Mean Difference	0	
df	189	
t Stat	0.81	
P(T<=t) one-tail	0.21	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.43	
t Critical two-tail	1.97	

A Two-Sample, *t*-Test of independent means was conducted to see if the student scores of those whose integrated technology once per week were higher than the scores of students whose teacher integrated technology one time per month or less. Table 15 shows a preliminary test of variances that revealed that the variances were equal. The Two-Sample, *t*-Test of Independent Means with equal Variances. revealed that the scores for students whose teacher integrated technology once per week (M = 2.78, SD = 0.71), were not significantly higher than those of English II students' scores of teachers who integrated technology one time per month or less (M = 2.86, SD = 0.67); $t(189) = 0.81$.

The researcher failed to reject the null and it was concluded that English II students' EOC scores were not affected by the frequency of technology integration by their teachers. The calculations for $NH_01.B.2$ and $NH_01.B.3$ are identical because the English II teachers answered both questions identically and therefore the same data was considered for the one time a month or less category and the one time a week category. Since the English II teachers' data is compared to their students' scores, the data analyzed was also the same resulting in the same analysis.

Null Hypothesis 2.A and 2.B Results

To examine the relationship between the type of learning approach and EOC scores, the researcher ran a two-Sample, *t*-test of independent means on EOC scores from students that were assessed during a year in which hybrid learning was required and a year in which seated learning took place. Refer to Table 6 for category information.

$NH_02.A$ Results

There is no difference between EOC scores Government students who have hybrid teaching and learning those who do not.

Table 17

$NH_0$2.A Government Results Two-Sample, t-Test Assuming Equal Variances

	Government 2018	*Government 2021*
Mean	2.87	2.45
Variance	0.98	0.39
Observations	31	31
Pooled Variance	0.48	
Hypothesized Mean Difference	0	
df	61	
t Stat	1.99	
P(T<=t) one-tail	0.03	
t Critical one-tail	1.68	
P(T<=t) two-tail	0.05	
t Critical two-tail	2.01	

The researcher conducted a preliminary test of variances, as shown in Table 17, which revealed the variances were not equal, therefore, a Two-Sample, *t*-Test of Independent Means with Unequal Variances was ran. The analysis revealed that the Government 2021 EOC scores for Hybrid-taught students (M = 2.45, SD = 0.61); $t(61)=1.99$, $p<0.03$, were significantly different from the Government 2018 Non-Hybrid taught students (M = 2.87, SD = 0.99); $t(61) = 1.99$, $p = .05$. The researcher rejected the null hypothesis and concluded that the 2021 Hybrid-taught Government students did have different scores than Non-Hybrid-taught 2018 Government students. Specifically, the one-tail test $p = 0.03$ indicates that the Non-Hybrid 2018 Government students had a significantly higher mean score than the Hybrid taught 2021 Government students.

$NH_0$2.B Results

There is no difference between EOC scores English II students who have hybrid teaching and learning those who do not.

Table 18

$NH_0$2.B Non-Hybrid vs. Hybrid ENG II Results Two-Sample, t-Test Assuming Equal Variances

English II EOC	*ENG II 2019*	*ENG II 2021*
Mean	2.81	2.84
Variance	0.36	0.41
Observations	31	31
Pooled Variance		0.38
Hypothesized Mean Difference		0
df		61
t Stat		0.2
P(T<=t) one-tail		0.42
t Critical one-tail		1.67
P(T<=t) two-tail		0.84
t Critical two-tail		2

As show in Table 18, the researcher conducted a preliminary test of variances which revealed the variances were equal. The researcher then conducted a Two-Sample, *t*-Test of Independent Means with Equal Variances. The analysis revealed that the English II 2021 EOC scores for Hybrid taught students (M = 2.84, SD = 0.61) were not significantly different than the English II 2019 Non-Hybrid taught students (M = 2.81, SD = 0.61); $t(61) = 0.20$, $p = .84$. The researcher failed to reject the null hypothesis and concluded that the 2021 Hybrid-taught English II students did not have different scores than Non-Hybrid taught 2019 English II students.

Summary

Chapter Four included an analysis of data that answered Research Questions 1 and 2, Null Hypothesis 1and 2. The quantitative data from Research Question 1 and Hypothesis 1 and 2 of this mixed-methods study showed that while teachers' perceptions of their digital proficiencies and the hybrid learning approach did have a statically

significant effect on student achievement on the Government EOC, the same cannot be said for English II students. Qualitative data from analysis of Research Question 2 revealed that teachers and students were forced to deal with many of the repercussions of the Covid-19 pandemic, and they did so in various manner. Chapter Five provides a thorough synthesis of all examined research questions and hypotheses examined. Additionally, suggestions for other K-12 school districts that may find themselves in similar situations to help guide them as they go 1:1 and possibly utilize a new alternate method of instruction is included.

Chapter Five: Summary and Conclusions

The purpose of this study was to examine how teachers' digital proficiency affected student achievement. More specifically, this mixed-method study aimed to analyze how teachers' digital proficiency perceptions affected student achievement in grades 9 to 12 through a hybrid instructional approach, due to the global Covid-19 Pandemic. This study was not only concerned with the numerical data collected during the study but also with qualitative data, the thoughts of both teachers and students that tell the story of the challenges they faced during the Covid-19 Pandemic. The timely study, which was actually conducted during the pandemic, can serve as a guide for other educators and districts as they face major challenges concerning hybrid learning and going 1:1.

Summary of the Study

The site school of this study was in a rural and impoverished area. This particular school was just beginning to explore technology integration in the classroom at the onset of the Covid-19 Pandemic. Teachers had access to class sets of laptops shared among departments; however, the school was not 1:1 pre-pandemic, which changed when the Covid-19 global pandemic surfaced. In response to the pandemic, the site school quickly purchased a Chromebook for each child to meet the needs of all students as they prepared for a school year that was likely to change based on the Covid-positive rate in that community. Shortly after the year began, the positivity rate increased, forcing the district to go hybrid in grades 7 to 12 immediately after Labor Day weekend. Instruction remained hybrid until students returned for the second semester in January 2021. While teachers and administrators did their best, given the circumstances, it was evident that

more professional development and time to prepare for the journey to go 1:1 would have helped and would have alleviated the pressure and stress felt by teachers (L. Wilson, personal communications, September 10, 2021). Effective professional development, according to researchers, is critical for achieving meaningful change in school leaders' practices, teachers' instructional methods, and student learning (Moore et al., 2011). This practice also allows teachers and school administrators to improve their skills, becoming more proficient in their jobs (Incompassing Ed, 2021). Galeas (2015), the District Technology Coordinator for the Laurel School District in Mississippi, identified three reasons for the importance of quality professional development for teachers and administrators before a district fully implements a 1:1 plan. Galeas (2015) stated:

- Narrowing the focus of professional development allows the teachers to master one skill at a time
- If know it, will use it. It's about empowering the teacher by building their confidence and ability in using the digital tools first and instructional strategies soon after
- If know it and use it, students will benefit. Our goal is to increase student engagement. Our goal is to show students that school is relevant to life. If we empower, encourage, and set the expectation for teachers to use digital tools along with effective instructional strategies, we will see our students grow and qualify for those future jobs. (Galeas, 2015, para 4-7)

An estimated 43,000 students have lost a parent to Covid-19 at this point. In addition to remote or hybrid learning for an entire year, this trauma placed unmeasurable amounts of stress on students' lives (Curtis, 2021, para. 1). These students, dealing with emotional

challenges, including fear of losing loved ones to Covid, were forced to learn a new way of education, which called for more time management skills and self-discipline while processing the feeling of loss of social interaction with fellow students and the loss of relationships with teachers. The goal of this study was to examine the connection, if any, between all factors involved in public schooling during a global pandemic: technology integration, teacher comfort and proficiency with technology, student perceptions of their teachers' abilities, the effect of hybrid instruction on student achievement, and any educational tragedies and benefits that arose from Covid-19.

Research Question 1

RQ1.A: What are teachers' perceptions of their digital abilities?

By examining the Teacher Perception Surveys results, it was apparent that English Language Arts (ELA) teachers' self-perception of their digital abilities was twice as high as their colleagues who taught Social Studies (SS). For example, the ELA teachers perceived themselves as having a high level of digital proficiency on 57% of the questions based on the ISTE Standards. In contrast, SS teachers indicated they felt that they had a high level of digital proficiency on 29% of the questions. Fifty percent of ELA teachers and the SS teachers surveyed groups believed themselves to possess a high level of digital proficiency on question 2.

Out of the seven statements on the Teacher Perception Survey, teachers seemed to feel the most confident concerning questions number 1 and 4. Statement 1: *I continue to improve my practice by learning from and with others and exploring proven practices that use technology to improve student learning*. Statement 4: *I dedicate time to collaborate with both colleagues and students to improve practice, discover and share*

resources and ideas, and solve problems. After examining those two statements, based on ISTE Standard 1 and 4 for Educators, it was evident that teachers felt confident in their ability to collaborate with others and see value in the resulting understanding and growth that often occurs due to the practice of learning from one another. A Professional Learning Community (PLC) is "an ongoing process in which educators work collaboratively in recurring cycles of collective inquiry and action research to achieve better results for the students they serve" (DuFour et al., 2016, p. 10) and has become a significant area of focus for the district of the study school. The renewed focus on and belief in the PLC process, centered on the effectiveness of collaboration, seems to have provided teachers a sense of confidence in their ability to collaborate and the effect on student achievement.

Analysis of the Teacher Perception Survey results indicated that teachers surveyed felt most inadequate in their ability to seek leadership opportunities to support student achievement. ISTE Standard 2 Statement 2: *I seek out opportunities for leadership to support students' empowerment and success and to improve teaching and learning.* This study school did not commit to being a 1:1 school until the Covid-19 Pandemic surfaced, so technology integration was still a relatively new concept to those educators, which may be why they were not as confident in seeking out those leadership opportunities.

RQ1.B: What are students' perceptions of their teachers' digital proficiencies?

Based on the analysis results of the Student Perception Surveys, it was evident that students' perception of their Social Studies teachers' digital proficiencies was much higher than that of their ELA teachers. For example, students perceived their Social

Studies teachers as having a high level of digital proficiency on 86% of the questions based on the ISTE Standards. In contrast, students perceived ELA teachers to have a high level of digital proficiency on 14% of the questions.

Out of the seven questions on the Student Perception Survey, students had the highest confidence in their teachers' abilities concerning Statement 1. Statement 1: *I continue to improve my practice by learning from and with others and exploring proven practices that use technology to improve student learning*. As stated earlier, the study school district emphasized increasing belief and understanding in the PLC process among the staff. Based on the survey results, teachers' confidence is also evident to the students.

Results from the Student Perception Survey indicated that students surveyed felt most unsure about their teachers' abilities to collaborate, inspire students to interact in the digital world, and create authentic lessons. Sixty-eight percent of students surveyed indicated that they believed their teachers to have high abilities concerning collaboration, which was the focus of Statement 4. ISTE Standard 4 Statement 4: *I dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems.* The low student perception of teachers' abilities concerning this particular ISTE standard seemed to contradict their highest perception of their teachers' abilities as both standards focus on collaboration. However, after careful analysis, one can understand that while ISTE Standard 1 focuses on collaboration; it vaguely states that the educator *learns from and with others and explores proven practices that use technology to improve student learning.* ISTE Standard 4, on the other hand, is more specific, requiring educators to dedicate time for collaboration with both colleagues and students and doing so with the intent to solve problems.

Students also seemed to be less confident in their teachers' abilities to teach them how to become active participants in the digital world. ISTE Standard 3: *I inspire students to positively contribute to and responsibly participate in the digital world.* Due to the pandemic causing the extreme manner in which this study school transitioned to a 1:1 setting, there was not ample time for professional development for the staff. Professional development would have included the foundation of digital citizenship: what it is, why it is necessary, and how to relay its importance to students. Based on the survey results, the students recognized the evidence of this lack of training, with 70% of students surveyed perceived their teachers as highly proficient in this area. Seventy percent of students surveyed also believed their teachers to have a high proficiency rate in designing meaningful learning experiences, which matched the lowest perception topic, based on the Student Perception Survey results. ISTE Standard 5 Question 5: *I design authentic, learner-driven activities and environments that recognize and accommodate learner variability*. Advances in technology have changed the learning environment (Webmaster, 2021). For example, technology allows students to play a more active role in their learning process, putting them in the driver's seat. Still, without proper training on how to use technology to make this happen, educators go back to what they know, which is a teacher-centered approach.

Research Question 2

What are the thoughts of teachers and students as it pertains to the factors that affect student achievement during the Covid-19 Pandemic?

A questionnaire that contained 11 open-ended questions for teachers and 10 open-ended questions for students that focused on participants' views of education during

the global pandemic were used to gain qualitative data. Eight students and 10 teachers participated in this voluntary survey. These data were collected to analyze Research Question 2. These qualitative data were collected by utilizing the *Qualtrics* software instrument required by the research university (see Appendix C).

A portion of the survey was used to gather data to analyze the thoughts of teachers and students regarding perceived pros and cons of the hybrid instructional approach. Thirty-six percent of those surveyed noted their increased intentionality to standards and key concepts as they switched to the hybrid instructional model. Teachers also indicated that another benefit of going hybrid was their perceived increased effectiveness on instruction due to going 1:1. Flexibility was the common theme as students shared their perceived advantages of going hybrid. Students appreciated the ability to work at their own pace and the perceived additional time available for students to pick up extra shifts for those who worked. Time to work seemed important for these students living in this high-poverty area.

On the other hand, teachers viewed the lack of connection to students as a significant challenge of the hybrid instructional approach. The lack of face-to-face time with students resulted in teachers' fear about the students' commitment to learning in a new setting. According to survey results, students seemed to agree somewhat with their teachers that the lack of connection was a con of going hybrid. Students struggled to communicate with their teachers during this time of alternate means of learning. A major theme when reflecting on the challenges of the time of hybrid learning, according to students surveyed, was the absence of the social aspect of school.

During this trying time in the world, both teachers and students had respective worries (L. Wilson, personal communication, September 10, 2021). While teachers worried if the students would be able or willing to adapt to the new learning approach, the students surveyed reported that they grappled with the fear of losing their parents to the Covid-19 Pandemic. Both groups involved viewed a decrease in student learning as the major tragedy of the pandemic as it pertains to education. The concern of learning regression was validated when Dorn et al. (2021) revealed that students were five months behind in math and four months behind in reading by Spring 2021 (p. 4).

Teachers and students agreed that the pandemic had changed education forever, but the two groups viewed this change differently. Whereas teachers recognized that virtual learning is here to stay in one way or another, students were cognizant of the increased student independence that the pandemic has provided. While students viewed the sense of independence as the primary benefit due to the pandemic, teachers agreed that the more significant role that students play in their learning is a primary benefit of the pandemic.

Null Hypothesis 1

$NH_0$1.A.1: There is no difference in students' Government scores based on the teachers' comfort and confidence levels with technology.

By examining the TUPS survey results concerning Government teachers' comfort and confidence level with technology, teachers who had an average level of comfort and confidence with technology also had the highest Government End-of-Course (EOC) score average. The results of the Scheffe' test indicated that while there was not a significant difference in Government EOC means between teachers who had a Medium-Low and

High Comfort and Confidence level; there was a significant difference every time the teachers who had an Average Comfort and Confidence level were compared to other groups (Medium-Low vs. Average and Average vs. High). This commonality suggested that the Average group is key. Somehow, the Government teacher(s) with an average sense of comfort and confidence regarding technology use resulted in higher student achievement.

$NH_0$1.A.2: There is no difference in students' Government scores based on the teachers' perception of technology use.

After analyzing the results of the TUPS survey concerning Government teachers' perception of their technology use, it is evident that teachers who had a High perception of their technology use also had the highest Government EOC score average. The results of the Scheffe' test indicated that while there was not a significant difference in Government EOC means between teachers who had a Medium-Low and Average Technology Use level; there was a significant difference every time the Government teachers who had a High Technology Use level were compared to other groups (Medium-Low vs. High and Average vs. High). This commonality suggested that the High group was key, that Government teacher(s) with more extensive knowledge of how to use technology effectively in instruction obtained a higher level of student achievement.

$NH_0$1.A.3: There is no difference in students' Government scores based on the teachers' level of technology integration.

Analysis of the *t*-Test results used to determine if scores of students whose Government teachers integrated technology every day were higher than the scores of students whose Government teachers integrated technology several times a week revealed

a statistically significant difference in the Government EOC scores of those two groups of students. These results indicated that the frequency of technology integration in the classroom increased student achievement. According to Al-Bataineh et al. (2016), students' technology proficiency and frequency of technology-based class activities and small-group interactions improved due to technology immersion. Schools strive to make improvements and immerse students and instructors in technology as the emphasis on student learning and accomplishment increases. With improvement, comes an ability and responsibility to train and uphold high learning standards for teachers and students (Al-Bataineh et al., 2016).

$NH_0$1.B.1: There is no difference in students' English II scores based on the teachers' comfort and confidence levels with technology.

Analysis of the two-sample, *t*-Test results to determine if students' English II EOC scores were affected by their teacher's Comfort and Confidence level showed that scores of students whose teacher had a Medium-High Level of Comfort and Confidence (M = 2.86, SD = 0.67) were not significantly higher than those of English II students' scores whose teachers had an Average Level of Comfort and Confidence (M = 2.78, SD = 0.71). These results indicated that student achievement in English II was not affected by the teachers' Comfort and Confidence level with technology.

$NH_0$1.B.2: There is no difference in students' English II scores based on the teachers' perception of technology use.

Similarly, $NH_0$1.B.1 results from the two-sample, *t*-Test concerning the effectiveness of teachers' perception of their technology use indicated that these perceptions did not affect the English II EOC scores. The *t*-Test results showed that the

scores of students whose teachers had a Medium-High Level of Technology Use (*M* = 2.78, *SD* = 0.71) were not significantly higher than the scores of English II students whose teachers had an Average Level of Technology Use (*M* = 2.86, *SD* = 0.67). One primary consideration is that the English II EOC assessment has not changed from 2019 to 2021. In contrast, the Government EOC was an entirely new assessment that required critical thinking and reading comprehension skills instead of basic recall skills that were the focus of the previous test.

$NH_0$1.B.3: There is no difference in students' English II scores based on the teachers' level of technology integration.

Finally, the *t*-Test results of the effectiveness of the frequency of technology integration in the English II classrooms showed that the English II scores were not affected by the recurrence of this integration. The *t*-Test analysis with equal variances revealed that the scores for students whose teachers integrated technology once per week (*M* = 2.78, *SD* = 0.71) were not significantly higher than the scores of English II students of teachers who integrated technology one time per month or less (*M* = 2.86, *SD* = 0.67). Having a lack of statistical difference led to questioning the effectiveness level regarding how the teachers integrated the technology. According to the Substitution, Augmentation, Modification, and Redefinition (SAMR) model, the ultimate goal of technology integration is to radically transform how individuals teach and learn, allowing them to do things we could never do before we had access to technology (Puentedura, n.d.)

Null Hypothesis 2

$NH_0$2: There is no difference between scores of English II students and Government students who have hybrid teaching and learning those who do not.

To test this hypothesis, a two-Sample, *t*-Test of independent means on English II EOC scores from students assessed in 2021 was administered, comparing when hybrid learning was required, and 2019, when seated learning took place. The results indicated that $NH_0$2.A failed to reject the null hypothesis for English II because there was no significant difference in the scores. Of course, there could have been multiple reasons for this lack of significance. Still, when this result was considered alongside aspects of the results from the TUPS survey taken by teachers, the sense of urgency and time constraints brought on by the global pandemic resulted in teachers increasing their instructional focus on the "meat" of a standard. This focus could have kept student EOC scores from decreasing, which many respondents believed could have happened (E. Lovelace, personal communications, October 11, 2021).

To test the possible effect that hybrid learning had on Government EOC scores, a two-Sample, *t*-Test of independent means on 2021 Government EOC scores was administered, comparing, when hybrid learning was required, and 2018 Government EOC scores, when seated learning took place. The results of the *t*-Test for Government EOC scores indicated that $NH_0$2.B rejected the null hypothesis due to the significant difference in scores. One possible reason for this difference in scores, in addition to the fact that students and teachers were forced into a hybrid learning setting, was the fact that the 2021 Government EOC assessment was a new test that had a much larger focus on reading comprehension and skill-based knowledge, which could have caused the decrease in scores (D. Grupe, personal communications, February,2022).

Limitations

The study limitations included a limited population and state assessment cancelations. The voluntary nature of the study resulted in small sample sizes. While the student population of the study school was 1,125 students, 284 of those students were enrolled in English II and 310 were enrolled in Government in 2021. Only 57 students responded to the Student Perception survey, which served as the secondary data, and seven students volunteered to complete the open-ended survey, which provided primary data for the study. The teacher population of the site school was 85. Additionally, only six educators responded to the TUPS, and Teacher Perception survey for secondary data, and nine teachers provided primary data via the-survey.

The EOC scores used in this study are another possible limitation. There were no English II or Government scores for 2020 because the state education department canceled all state assessments that year due to Covid-19. There were also no Government EOC scores available for the Spring 2019 assessment because the assessment that year for the tested area was a field test and yielded no scores. The difference in students and assessments could potentially affect the study results.

Implications for Practice

The first recommendation is for the district to recognize the need for individualized approach to professional development. Just as educators know that a *one size fits all* approach is not feasible for students, the same can be said for teacher development as well. One of the advantages of personalized professional development is that it can easily be tailored to each teacher's goals and needs (Stegman, 2020). Results from the Teacher Perception Survey that analyzed Research Question 1, showed that the

ELA teachers perceived themselves as having a high level of digital proficiency on 57% of the questions based on the ISTE Standards, while SS teachers indicated they felt that they had a high level of digital proficiency on 29% of the questions. A blanketed professional development approach would not best serve these teachers since there is such a wide gap in their perception of their own digital proficiencies.

The study school, which is in the midst of recommitting themselves to the Professional Learning Community (PLC) process, should recognize the need to use the PLC groups to explore teacher needs for relationship building and learning from one another, as well as learning about tech integration from their colleagues. For educators to have continuing and regular opportunities to learn from one another, collaboration within a district and outside is critical (Serviss, 2021). PLCs provide a simple opportunity for teachers to share best practices and come up with new strategies to improve learning and raise student achievement (Serviss, 2021). According to Serviss (2021), this sense of sharing enhances the strengths of others, which builds trust and cultivates the relationship. This type of continual professional development keeps teachers up to date on new research and innovative classroom tools, as well as giving them a glimpse into what other schools are doing Serviss (2021).

It is important for the study school to recognize that not only should teachers learn from one another, but they also have the opportunity to learn from the meaningful feedback provided by students. Students have a greater stake in teaching efficacy than anyone else. There are no better experts on how teaching is received by its intended audience (Gates Foundation, 2012). It is recommended that the district of the study school continues to administer student perception surveys as a means of gaining the

thoughts of students as it pertains to teacher instruction and technology integration. According to a 2012 report released by the Bill and Melinda Gates Foundation, there are five main benefits to student perception surveys:

1. Feedback-Results point to strengths and areas for improvement.
2. “Face” Validity-Items reflect what teachers value.
3. “Predictive validity”-Results predict student outcomes.
4. Reliability-Results demonstrate relative consistency.
5. Low Cost-Expense of administration is minimal. (Gates Foundation, 2012, p. 4)

This data, based on the views of students, should be included as important piece of data that drives instruction in the study school.

The Teacher Perception Survey also revealed that teachers do not feel confident in their ability to seek out leadership opportunities that empower students and improve teaching and learning. It is necessary for school leaders to develop and express a clear vision of teacher learning, as well as encourage, monitor, and reward it, to promote it. Despite this, research suggests that effective leadership strategies that enhance teacher learning are few and far between (Schaik et al., 2020). These opportunities can come in many different forms such as leading teacher professional development sessions at an Educamp, lunch time PD, or opening up each faculty meeting by sharing a new teaching strategy. According to Schaik et al. (2020), the creation of a professional school culture is a crucial step in supporting teacher learning. Nonetheless, it has been discovered that a fundamental requirement for collaborative teacher learning is school leadership that supports, encourages, and promotes teacher learning.

Another recommendation that could benefit the study school is to analyze the results from the Teacher Perception Survey to understand which ISTE Standards need to be addressed, according to the survey results. The ISTE Standards were created to inspire educators worldwide to use technology to innovate teaching and learning, accelerate good practice, and solve tough problems in education (Almisad, 2020). According to Almisad (2020), incorporating technology into the teaching and learning process is essential. ISTE guidelines have provided valuable direction on how to incorporate technology into the classroom. The ISTE standards play an important role in assessing how technology might be used in the classroom (Almisad, 2020). The study school district has a techbrarian in each building, which is a position that includes responsibilities of a librarian and Technology Integration Coach. A resulting suggestion from this study is that the techbrarians of this district, as a team, analyze the Perception Survey results to discover which ISTE standards were connected with a low perception. The techbrarians used those low-rated standards as their focus for that year in the hopes of increasing efficacy in those areas of technology integration.

Additionally, the techbrarian also suggested that school leaders take measures to ensure that teachers understand the connection between the SAMR Model and ISTE Standards. The SAMR model can help teachers comprehend the role and usefulness of technology, while the ISTE Standards define essential technology skills that students should have. The interconnection of teachers, students, technology, and learning processes, as well as the possibility for relationships between these factors, are identified in these relationships (Humes, 2017). Teaching the connection between SAMR and ISTE

is another great responsibility for the techbrarians and/or technology teacher leaders of the study district.

One of the lowest perceived topics, according to the Perception Surveys, was the teachers' ability to design meaningful learning experiences. A suggestion to improve this obvious need is for school leaders to focus on the difference between teacher-centered learning experiences and others that are student-centered. Student-centered learning is an educational concept or strategy that is tailored to each student's specific needs (Freidhoff & Green, 2022). According to Freidhoff and Green (2022):

> Student-centered learning is about meeting students where they are and giving them what they need, but doing so in a way that meets the needs of each student individually. It is about giving students the ability to direct their own learning, go at their own pace, and demonstrate what they know in a way that truly shows their understanding. The ways in which school districts accomplish this personalization of student learning can vary, but it is clear that *true* student-centered learning is more than just providing students with a computer and a technology-rich learning environment. It requires turning traditional education, traditional classrooms, and traditional ways of thinking upside down. (para. 37)

To increase the understanding of student-centered teaching and learning, building administrators should work with the Building Leadership Teams, as well as the Professional Development Committees, to develop training and learning experiences that help all educators of that district truly understand what student-centered learning is, how it can transform student mastery, and what it looks like in action.

While the world began to hear rumblings about the Covid-19 pandemic, the United States public education system shut down quickly, leaving districts scrambling to make sure students and teachers were prepared for a new world of learning (Education Week, 2021). Another recommendation addresses the importance of determining technology-based teaching and learning integration needs regarding maintaining best-practices of technology use before emergencies take place and then providing professional development to meet the determined needs.

Technology integration is not a fad that will disappear from society; it is here to stay, so educators must seek to learn and use best practices involving technology. Professional development concerning technology integration should be ongoing. Just as technology constantly evolves, so should teachers' and students' knowledge of using it effectively. Professional development focused on technology needs cannot be introduced at the onset of integration and then never addressed again. Utilizing a reactive approach leads to a plateau in teachers' technology integration best practices knowledge and therefore, student learning.

Districts, such as the study school, at the beginning of the technology integration journey, need to lay a strong foundation of knowledge for their teachers. This strong foundation can begin by learning the SAMR model, which approaches technology as four different hierarchal tasks: Substitution, Augmentation, Modification, and Redefinition, which are grouped under two distinct areas, enhancement and transformation (Aldosemani, 2019). Since the purpose and function of schools are constantly changing and improving, teachers' abilities and competencies are expected to change as well (Aldosemani, 2019). After teachers have a good basic foundation of effectively

integrating technology into their instruction, the training should not end there. Administrators, technology integration coaches, and instructional coaches should offer quarterly, if not monthly, learning opportunities centered around using technology to increase student achievement. These opportunities could be provided in short snippets of professional development to avoid overwhelming teachers with one more thing added to their plates.

When districts plan to go 1:1, a clear plan for that journey is a must. Teachers and administrators must receive their devices one year before the students. To have confidence in their abilities, teachers need a year to become familiar with the device, receive a proper amount of professional development on using the device effectively, and adjust their curriculum as needed due to the possibilities that the devices offer. The rollout and professional development plan need to be strategic so that long-term goals are met. The plan also must be scaffolded so teachers can learn about technology integration in a step-by-step manner that will feel supported, which will lead to dedication instead of frustration.

If a district truly believes that technology integration is important and can increase student achievement, then it should be a clear district focus. Information concerning the focus should be relayed in a consistent message through all levels of leadership: superintendent, curriculum leaders, building principals, and technology and instructional coaches. Just as the importance of clarity for students is recognized, the same is true for teachers and administrators, as all learners. The three questions Hattie (2019) encouraged teachers to use to guide student learning should be used to guide teacher learning with technology: *What am I learning? Why am I learning it? How will I know when I have*

learned it? A clear roadmap with technology integration is more likely to result in long-lasting positive effects on student achievement.

Recommendations for Future Research

There are two recommendations to expand knowledge based on this study. First, it is beneficial to compare the scores of two groups of students, one group that participated in hybrid learning during the pandemic and another group that continued with the traditional method of seated instruction, to examine the differences in scores. While the study district went hybrid in grades 7 to 12 during the pandemic and grades K to 6 remained in seated instruction, which was not the most desirable comparison due to age differences and non-comparable content creating an inability to compare test scores across grade levels. Instead, researchers should compare identical grades from two different districts: a hybrid and a non-hybrid district of similar demographics. These data would shed additional light on the effect of hybrid instruction on learning.

The amount of research available concerning rural school districts was relatively minimal throughout this study. After the pandemic began, most research concerning districts' reactions to school closures, the glaring inequities in education, and the possible amount of "learning loss" centered on schools in urban settings with a wide variety of socioeconomic levels present. It was challenging to find research concerned with districts in small, impoverished towns. To truly represent all students in public education, a more extensive representation of the rural communities is necessary for research.

Chapter One Summary

Chapter One explained the foundation of this mixed-method research study focusing on examining students' and teachers' perceptions of technology comfort,

technology use, and technology integration, and its effects on achievement based on three specific content area perceptions the Covid-19 pandemic. Two research questions and two hypotheses aimed to provide data analysis surrounding the investigated perceptions.

Chapter Two Summary

The existing literature related to the research in this study was discussed in Chapter Two. The literature review included topics that impacted society during the Covid-19 Pandemic. The literature review also included topics regarding various teaching and learning competency difficulties before and during the Covid-19 Pandemic. Much of the research in this chapter focused on the importance of teachers' self-efficacy and the possibilities for achieving results when instructors' self-efficacy is strong.

Chapter Three Summary

A mixed-method research approach was utilized to answer two research questions and test two hypotheses as described in Chapter Three. The methodology, research design, study participants, instruments used, data collection, and data analysis were all explained in detail. The demographic sampling, data gathering methodologies and data analysis methods were outlined and described. Finally, the ethical implications were discussed.

Chapter Four Summary

Chapter Four featured a data analysis that displayed results for Research Questions 1 and 2, and Null Hypotheses 1and 2. While teachers' perceptions of their digital proficiencies and the hybrid learning approach did have a statically significant effect on student achievement on the Government EOC, the same cannot be said for

English II students, according to the quantitative data from Research Question 1 and Hypothesis 1 and 2.

Chapter Five Summary

Chapter five conveyed the specific findings of the study by presenting conclusions made based on the data analysis and study findings as related to the literature discussed in Chapter Two. This chapter also included a discussion regarding significant themes and findings relative to the body of knowledge covered throughout Chapter Two. Chapter Five included a summarized analysis of the investigated research questions and hypotheses. Teachers and students were compelled to deal with many of the implications of the Covid-19 pandemic, and they did so in a variety of ways, according to qualitative evidence from the study of Research Question 2. Implications for practice for other K-12 school districts that might experience similar situations were suggested to help navigate transitioning to becoming a 1:1 school, or a school that has provided a device for each student and maybe use a new alternate mode of instruction. Implications were also discussed that reiterated that using a one-size-fits-all approach to addressing technology integration during a pandemic is not recommended as it is not equitable, nor feasible to expect all students to learn in the hybrid-learning setting when educators have different ability levels concerning technology comfort and use.

Final Thoughts

The Covid-19 Pandemic quickly changed all aspects of society and education, as everyone encountered many challenges presented by the global pandemic as discussed throughout this study. Students, educators, and administrators faced various challenges. Educators across the globe were forced to quickly create a plan that would allow students

and teachers to remain safe, yet also allow educators to continue to incorporate meaningful learning. Districts of all sizes, students of all socioeconomic statuses, and schools in all locations were impacted by the Covid Pandemic, as discussed in Chapter Two. Recommendations for continued research surrounding how to measure the effectiveness of various instructional methods and the integration of technology to make informed decisions to better education outcomes were suggested, as it is important to recognize how the differences affect learning and teaching to determine what is needed for future technology 1:1 school implementation practice. Researchers should continue to determine the effectiveness of various instructional methods combined with various comfort levels, technology use, and integration of technology to continue to make informed decisions to better education outcomes.

While the Covid-19 pandemic was a horrific event that led to an unimaginable amount of loss in this world, it is essential for educators to recognize the positive outcomes of this terrible event in our history. As they always have, educators stepped up and did what was necessary to ensure that student learning did not stop when the world seemed to falter. Educators were the heroes; they have always been individuals who put students' needs first at all costs.

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Appendix A – RQ1.A Instrument 1

Qualitative Secondary Data Google Form

Teacher Perception Survey Questions

Teachers:

1. I continue to improve my practice by learning from and with others and exploring proven practices that use technology to improve student learning (EX: Set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness, Pursue professional interests by creating and actively participating in local and global learning networks. Stay current with research that supports improved student learning outcomes, including findings from the learning sciences.) (ISTE Standard for Educators #1)
2. I seek out opportunities for leadership to support students' empowerment and success and to improve teaching and learning (EX: Shape, advance and accelerate a shared vision for empowered learning with technology by engaging with education stakeholders. Advocate for equitable access to educational technology, digital content, and learning opportunities to meet the diverse needs of all students. Model for colleagues the identification, exploration, evaluation, curation, and adoption of new digital resources and tools for learning.) (ISTE Standard for Educators #2)
3. I inspire students to positively contribute to and responsibly participate in the digital world. (EX: Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that build relationships and community, establish a learning culture that promotes curiosity and critical examination of online resources and fosters digital literacy and media fluency, mentor students in the safe, legal and ethical practices with digital tools and the protection of intellectual rights and property, model and promote management of personal data and digital identity and protect student data privacy.) (ISTE Standard for Educators #3)

4. I dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems. (EX: Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology, collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues, use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams, and students, locally and globally, and demonstrate cultural competency when communicating with students, parents, and colleagues and interact with them as co-collaborators in student learning.) (ISTE Standard for Educators #4)
5. I design authentic, learner-driven activities and environments that recognize and accommodate learner variability. (EX: Use technology to create, adapt and personalize learning experiences that foster independent learning and accommodate learner differences and needs, design authentic learning activities that align with content area standards and use digital tools and resources to maximize active, deep learning, explore and apply instructional design principles to create innovative digital learning environments that engage and support learning.) (ISTE Standard for Educators #5)
6. I facilitate learning with technology to support student achievement of the 2016 ISTE Standards for Students. (EX: Foster a culture where students take ownership of their learning goals and outcomes in both independent and group settings, manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on maker spaces or in the field, create learning opportunities that challenge students to use a design process and computational thinking to innovate and solve problems, and model and nurture creativity and creative expression to communicate ideas, knowledge or connections.) (ISTE Standard for Educators #6)
7. I understand and use data to drive their instruction and support students in achieving their learning goals. (EX: Provide alternative ways for students to demonstrate competency and reflect on their learning using technology, use technology to design and implement a variety of formative and summative

assessments that accommodate learner needs, provide timely feedback to students, and inform instruction, and use assessment data to guide progress and communicate with students, parents and education stakeholders to build student self-direction (ISTE Standard for Educators, #7).

Appendix B – RQ1.B Instrument 2

Qualitative Secondary Data Google Form

Student Perception Survey Questions

Students:

1. Does your teacher continue to improve his/her practice by learning from and with others and exploring proven practices that use technology to improve your learning? (Ex: Does your teacher set professional learning goals to explore and apply good teaching strategies made possible by technology and reflect on their effectiveness?) (ISTE Standard for Educators #1)
2. Does your teacher seek out opportunities for leadership to support students' empowerment and success and to improve teaching and learning? (Ex: Does your teacher set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness, pursue professional interests by creating and actively participating in local and global learning networks. Stay current with research that supports improved student learning outcomes, including findings from the learning sciences.) (ISTE Standard for Educators #1)
3. Does your teacher seek out opportunities for leadership to support students' empowerment and success and to improve teaching and learning? (Ex: Does your teacher shape, advance, and accelerate a shared vision for empowered learning with technology by engaging with education stakeholders, advocate for equitable access to educational technology, digital content, and learning opportunities to meet the diverse needs of all students, and model for colleagues the identification, exploration, evaluation, curation, and adoption of new digital resources and tools for learning.) (ISTE Standard for Educators #2)
4. How well does your teacher inspire students to positively contribute to and responsibly participate in the digital world? (EX: Does your teacher create experiences for you to make positive, socially responsible contributions and exhibit empathetic behavior online that build positive and appropriate relationships? Does he/she establish a learning culture that promotes curiosity and

careful examination of online resources? Does he/she encourage digital literacy and a safe understanding of social media? Does he/she help students understand the importance of being safe and smart with digital tools?) (ISTE Standard for Educators #3)

5. Does your teacher dedicate time to work with you to improve practice, discover and share resources and ideas, and solve problems? (EX: Does your teacher work with students to discover and use new digital resources and diagnose and troubleshoot technology issues? Does he/she use collaborative tools to expand students' real-world learning experiences by engaging virtually with experts, teams, and students, locally and globally?) (ISTE Standard for Educators #4)
6. How well does your teacher design authentic, student-driven activities and environments that recognize and accommodate student learning differences? (EX: How well does your teacher use technology to create, adapt and personalize learning experiences that encourage independent thinking? Does he/she create creative learning activities that use technology that helps you learn on a deeper level? Does he/she create innovative digital learning environments that engage and support learning?) (ISTE Standard for Educators #5)
7. Does your teacher facilitate learning with technology to support student technology use? (EX: Does your teacher encourage you to take ownership of your learning goals and outcomes in both independent and group settings? Does he/she help you manage the use of technology? Does he/she create learning opportunities that challenge you to use a design process to think creatively and solve problems? Does he/she model and encourage creativity to communicate ideas, knowledge, or connections?) (ISTE Standard for Educators #6)
8. Does your teacher seem to adjust his/her teaching based on your classwork/test scores to help you achieve your learning goals? (EX: Does your teacher provide a variety of ways for you to show your understanding and reflect on your learning using technology? Does he/she use technology to create different types of tests that accommodate different learning styles? Does he/she provide timely feedback to you?) (ISTE Standard for Educators #7)

Appendix C – RQ.2 Instrument 3

Qualitative Primary Data *Qualtrics*

Open Ended Interview Questions for Teachers:

- What was the biggest challenge for you as it pertains to Hybrid Instruction?
- How did the change in instructional approaches during COVID-19 affect you as a teacher?
- Do you feel that going 1:1 helped you deal with teaching during a global pandemic?
- What did you miss most about the traditional teaching approach?
- What was your biggest worry for students during this time?
- Some say that this pandemic has changed the face of education forever. Do you agree? Why or why not?
- What educational benefits, if any, have come from Covid?
- What educational tragedies, if any, have occurred due to Covid?
- What was the hardest part of moving your classes online?
- Are you proud of how you have handled the Covid situation in school? What are you proud of in particular?
- What were your biggest concerns about hybrid/online teaching?

Open Ended Interview Questions for Students:

- What was the biggest challenge for you as it pertains to Hybrid Learning?
- How did the change in instructional approaches during COVID-19 affect you as a student?
- Did you feel that going 1:1 helped you or hindered you in learning during a global pandemic? Explain.
- What did you miss most about the traditional school setting?
- What was your biggest worry during the Covid Pandemic?
- Some say that this pandemic has changed the face of education forever. Do you agree? Why or why not? What will school look like for the next generation?
- What educational benefits, if any, have come from Covid?
- What educational tragedies, if any, have occurred due to Covid?

- Are you proud of how you have handled the Covid situation in school? What are you proud of in particular?
- What were your biggest concerns about hybrid/online learning?

Appendix D – H1.A/H1.B Instrument 4

Quantitative Secondary Data

TUPS — Perceptions of Technology Use (Status: Incomplete)

In this section, we are exploring how technology relates to you and your students.

Technology refers to hardware, software, and connectivity that allow students or teachers to search for, create, manipulate, or consume digital content.

Please read the following statements and select the one response that best reflects your level of agreement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I would like every student in my class(es) to have access to a digital device.	○	○	○	○	○
2. Technology skills are essential to my students' success in school.	○	○	○	○	○
3. Technology skills are essential to my students' success in their future workplace.	○	○	○	○	○
4. More training would increase my use of technology in my teaching.	○	○	○	○	○
5. Technology makes my job easier.	○	○	○	○	○
6. Technology changes my role as a teacher.	○	○	○	○	○
7. I can help others solve technology problems.	○	○	○	○	○
8. Technology enhances my teaching.	○	○	○	○	○
9. Student use of technology enhances student performance.	○	○	○	○	○
10. My use of technology enhances student performance.	○	○	○	○	○
11. Technology should be used in all courses.	○	○	○	○	○
12. I would like my students to be able to use technology more in their classes.	○	○	○	○	○

TUPS — Confidence and Comfort Using Technology (Status: Incomplete)

Your responses in this section help describe your comfort and confidence using technology in your teaching.

Technology refers to hardware, software, and connectivity that allow students or teachers to search for, create, manipulate, or consume digital content.

Please read the following statements and select the one response that best reflects your level of agreement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I have had adequate training in technology use.	○	○	○	○	○
2. I currently have adequate opportunities for technology training in my school.	○	○	○	○	○
3. I am prepared to effectively integrate technology into my teaching.	○	○	○	○	○
4. I am prepared to assess multimedia projects.	○	○	○	○	○
5. I am prepared to guide other teachers in planning and implementing lessons that incorporate technology.	○	○	○	○	○
6. I am comfortable using technology in my teaching.	○	○	○	○	○
7. I am comfortable assigning multimedia projects to my students.	○	○	○	○	○
8. I use technology effectively in my teaching.	○	○	○	○	○
9. I am developing expertise in the uses of technology in teaching.	○	○	○	○	○
10. I am prepared to recognize the unethical uses of technology.	○	○	○	○	○
11. I am comfortable teaching my students about copyright and fair use guidelines.	○	○	○	○	○

This section helps us understand what technology use looks like in your classroom by asking how frequently you use a range of different pedagogical approaches.

Technology refers to hardware, software, and connectivity that allow students or teachers to search for, create, manipulate, or consume digital content.

Listed below are teaching modes in which technology may be used. Please select the response that best indicates how often you use technology in each teaching mode.

	Not at All	Once per Month or Less	Once per Week	Several Times per Week	Every Day	Multiple Times per Day
1. Small group instruction	○	○	○	○	○	○
2. Individual instruction	○	○	○	○	○	○
3. Cooperative groups	○	○	○	○	○	○
4. Independent learning	○	○	○	○	○	○
5. As an extension activity	○	○	○	○	○	○
6. As a reward	○	○	○	○	○	○
7. To tutor / for remediation	○	○	○	○	○	○
8. As a research tool for my students	○	○	○	○	○	○
9. As a tool for students to use in planning and managing projects (individual and group)	○	○	○	○	○	○
10. As a productivity tool for my instruction (e.g., to create charts, reports or other products)	○	○	○	○	○	○
11. As a student presentation tool (including multimedia)	○	○	○	○	○	○
12. Student discussion/communication	○	○	○	○	○	○
13. Instructional delivery	○	○	○	○	○	○
14. As a communication tool (e.g., email, electronic discussion)	○	○	○	○	○	○
15. To create online content for my students (web pages, blogs, etc.)	○	○	○	○	○	○
16. To assess student learning	○	○	○	○	○	○

Appendix E - Site Approval

Research Approval for Site School Letter
March 11, 2021

Dr. Lori Wilson
Superintendent of West Plains Schools
610 E. Olden
West Plains, MO 65775

Dear Dr. Wilson,

I am writing to request permission to conduct a research study at West Plains High School. I am currently enrolled in the Instructional Leadership Doctoral Program at Lindenwood University and am in the process of writing my dissertation, Examining Digital Proficiencies Perceptions and Correlation to Achievement During the Covid-19 Pandemic in a Rural Mid-Western High School.

During the current school-year, the administration will ask teachers and students to participate in the completion of the Technology Usage and Perception Survey (TUPS). This online survey examines teachers' beliefs about the role of technology in the classroom, as well as their comfort level with technology integration. The survey tests their knowledge of different instructional technology tools and explores their frequency of using these tools. The tool is broken down into seven categories, that will give the district valuable information that will help with decision making as the district move forward in the 1:1 initiative that started this year. I would like to collect this secondary data and also recruit 10 to 15 of those teachers and students to participate in follow-up *Qualtrics* surveys, which will allow me to dig deeper into examining student and teacher views on technology integration.

I would like to ask approximately 10 – 25 teachers to complete a researcher-made survey that examines what teachers believe about the role of technology in the classrooms, as well as their comfort level of technology integration. In addition to the teacher's perspective, I also plan to gain the student's perspective by surveying 30-45 students about their perceptions of their teachers' digital proficiency. I will use *Qualtrics*

for this survey. These surveys will help me understand what students and teachers believe truly affects student achievement during this global pandemic. The survey will be sent via teachers' and students' school email, with your permission.

If approval is granted, teachers and students will complete the survey online during a time that is most convenient and least disruptive to learning. I will also require parent permission for students to participate in this study. The participant's identity will remain anonymous during the survey, as all sensitive identifiable data will be removed.

Please contact me if you have any questions that I can answer concerning the study. You may sign below if you choose to approve my study in your district.

Sincerely,

Tiffany James Young

I agree to allow Tiffany James Young to conduct research at West Plains High School.

Dr. Lori Wilson

Superintendent of Schools
West Plains Schools

Appendix F - Email Invitation

Teacher Consent Email Script

Hello,

You are asked to participate in a survey being conducted by Tiffany James Young, under the guidance of Jackie Ramey at Lindenwood University. We are doing this study to analyze how teacher digital proficiency affects student achievement in grades 9-12 through the use of a hybrid instructional approach as a result of the global Covid-19 Pandemic. It will take about 15 minutes to complete the survey. Please click the link below that will take you to the brief survey on your experience of teaching during the Covid-19 Pandemic.
https://lindenwood.az1.qualtrics.com/jfe/form/SV_8Gj514KWssx4vtk
Thank you for participating in a study that focuses on learning from the past year and making improvements as we move forward.

Sincerely,

Tiffany James Young

Parental Consent Email Script

Hello,

Your child is being asked to participate in a survey being conducted by Tiffany James Young, under the guidance of Jackie Ramey at Lindenwood University. We are doing this study to analyze how teacher digital proficiency affects student achievement in grades 9-12 through the use of a hybrid instructional approach as a result of the global Covid-19 Pandemic. It will take about 15 minutes to complete the survey. Please click the link below that will take you to the brief survey on your experience of teaching during the Covid-19 Pandemic.
https://lindenwood.az1.qualtrics.com/jfe/form/SV_3mXwhUYj6VL098y

Please see the attached Parental Consent on Behalf of a Minor form.
Thank you for participating in a study that focuses on learning from the past year and making improvements as we move forward.

Sincerely,
Tiffany James Young

Student Assent Email Script

Hello,

You are asked to participate in a survey being conducted by Tiffany James Young, under the guidance of Jackie Ramey at Lindenwood University. We are doing this study to analyze how teacher digital proficiency affects student achievement in grades 9-12 through the use of a hybrid instructional approach as a result of the global Covid-19 Pandemic. It will take about 15 minutes to complete the survey. Please click the link below that will take you to the brief survey on your experience of teaching during the Covid-19 Pandemic.
https://lindenwood.az1.qualtrics.com/jfe/form/SV_bIohe0qNHWyFGDk

Thank you for participating in a study that focuses on learning from the past year and making improvements as we move forward.

Sincerely,

Tiffany James Young

Appendix G - Consent and Assent

LINDENWOOD

Research Study Assent Form

What is research?

We are going to do a research study. A research study is when a researcher or doctor collects information to learn more about something. During this research study, we are going to learn more about what affects student scores during a global pandemic. After we tell you more about this study, we would like to ask you about being part of it.

We also will be asking about 30-45 other people to be part of this study.

What will you ask me to do?

If you choose to be part of this study, you will be asked to complete a survey about your perception of teachers' digital proficiency and technology integration in the classroom. This survey will be anonymous, and results will not be shared with the teachers. The questions in this survey will deal with going to school during the Covid-19 pandemic, hybrid learning, using Chromebooks in school, and student learning during this year.

This survey questions and open-ended questions should last approximately 40 minutes.

Will I benefit from being in this study?

You will not get anything special if you decide to be part of this study. We hope what we learn will help other children and other schools that are learning how to navigate their way through education during a global pandemic.

Do I have to be in this research?

No, you do not. If you do not want to be in this research study, just tell us. You can also tell us later if you do not want to be part of it anymore. No one will be mad at you and you can talk to us at any time if you are nervous.

What if I have questions?

You can ask us questions right now about the research study. You can ask questions later if you want to. You can also talk to someone else about the study

if you want to. And you can change your mind at any time. Being in this research study is up to you.

If you want to be in this research study, just tell us. Or you can sign your name in the blank below. We will give you a copy of this form to keep.

_____

Minor Participant's Signature **Date**

_____

Minor Participant's Printed Name

Signature of Principle Investigator or Designee **Date**

_____

Investigator or Designee Printed Name

LINDENWOOD

Research Study Consent Form

Examining Digital Proficiencies Perceptions and Correlation to Achievement During the Covid-19 Pandemic in a Rural Mid-Western High School

Before reading this consent form, please know:

- Your decision to participate is your choice
- You will have time to think about the study
- You will be able to withdraw from this study at any time
- You are free to ask questions about the study at any time

After reading this consent form, we hope that you will know:

- Why we are conducting this study
- What you will be required to do
- What are the possible risks and benefits of the study
- What alternatives are available if the study involves treatment or therapy
- What to do if you have questions or concerns during the study

We are interested in learning about how teacher digital proficiency affects student scores in grades 9-12 through the use of a hybrid instructional approach as a result of the global Covid-19 Pandemic.

You will be asked to complete two surveys that focus on your digital proficiencies and open-ended questions focused on what teaching is like during a global pandemic.

LINDENWOOD

Research Study Consent Form

Examining Digital Proficiencies Perceptions and Correlation to Achievement During the Covid-19 Pandemic in a Rural Mid-Western High School

You are asked to participate in a research study being conducted by Tiffany James Young under the guidance of Dr. Jamie Ramey at Lindenwood University. Being in a research study is voluntary, and you are free to stop at any time. Before you choose to participate, you are free to discuss this research study with family, friends, or a physician. Do not feel like you must join this study until all of your questions or concerns are answered. If you decide to participate, you will be asked to sign this form.

Why is this research being conducted?

We are doing this study to analyze how teacher digital proficiency affects student scores in grades 9-12 through the use of a hybrid instructional approach as a result of the global Covid-19 Pandemic. Although research has been completed concerning teacher digital proficiency, technology integration, and hybrid learning, very little of that research has focused on small rural schools in impoverished areas, and almost none of that research has centered on the hybrid instructional approach during a pandemic, due to the fact that the pandemic is still active. Because there has been such little research conducted concerning the location and global pandemic aspects of this study, other comparable districts can learn from this study as they move forward with their own technology integration, including during a hybrid learning approach. We will be asking about 85 other people to answer these questions.

What am I being asked to do?

You will be asked to complete two surveys dealing with your digital proficiencies and your view of technology's role in the classroom. Next, a small group of participants will be asked to participate in a short *Qualtrics* survey concerning teaching in a hybrid approach and also what education is like during a global pandemic.

How long will I be in this study?

The survey will take approximately 20 to 40 minutes.

What are the risks of this study?

We will be collecting data that could identify you, but each survey response will receive a code so that we will not know who answered each survey. The code connecting you and your data will be destroyed as soon as possible.

We are also collecting data that could identify you, such as open-ended question responses, however, every effort will be made to keep your information secure. Only members of the research team will be able to see any data that may identify you.

What are the benefits of this study?

You will receive no direct benefits for completing this survey. We hope what we learn may benefit other people in the future.

What if I do not choose to participate in this research?

It is always your choice to participate in this study. You may withdraw at any time. You may choose not to answer any questions or perform tasks that make you uncomfortable. If you decide to withdraw, you will not receive any penalty or loss of benefits. If you would like to withdraw from a study, please use the contact information found at the end of this form.

What if new information becomes available about the study?

During the course of this study, we may find information that could be important to you and your decision to participate in this research. We will notify you as soon as possible if such information becomes available.

How will you keep my information private?

We will do everything we can to protect your privacy. We do not intend to include information that could identify you in any publication or presentation. Any information we collect will be stored by the researcher in a secure location. The only people who will be able to see your data are members of the research team, qualified staff of Lindenwood University, representatives of state or federal agencies.

How can I withdraw from this study?

Notify the research team immediately if you would like to withdraw from this research study.

Who can I contact with questions or concerns?

If you have any questions about your rights as a participant in this research or concerns about the study, or if you feel under any pressure to enroll or to continue to participate in this study, you may contact the Lindenwood University Institutional Review Board Director, Michael Leary, at (636) 949-4730 or mleary@lindenwood.edu. You can contact the researcher, Tiffany Young directly at (417) 569-8387 ext 4569 or tiffany.young@zizzers.org. You may also contact Dr. Jackie Ramey at jramey@lindenwood.edu.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.

Participant's Signature	**Date**
Participant's Printed Name	**Date**
Signature of Principle Investigator or Designee	**Date**
Investigator or Designee Printed Name	**Date**

LINDENWOOD

Research Study Consent Form

Examining Digital Proficiencies Perceptions and Correlation to Achievement During the Covid-19 Pandemic in a Rural Mid-Western High School

Note: "You" in this form refers to the minor participant. If an activity or requirement refers to the parent or guardian consenting on behalf of the minor, this will be clearly indicated.

Before reading this consent form, please know:

- Your decision to participate is your choice
- You will have time to think about the study
- You will be able to withdraw from this study at any time
- You are free to ask questions about the study at any time

After reading this consent form, we hope that you will know:

- Why we are conducting this study
- What you will be required to do
- What are the possible risks and benefits of the study
- What alternatives are available if the study involves treatment or therapy
- What to do if you have questions or concerns during the study

Basic information about this study:

We are interested in learning about how teacher and student perception of teacher digital proficiency, as well as a teacher's confidence and comfort level affect student scores in grades 9-12 through the use of a hybrid instructional approach as a result of the global Covid Pandemic.

You will be asked to complete one survey that focus on your perception of teacher digital proficiencies and open-ended questions focused on what learning is like during a global pandemic.

All survey results will be anonymous and will not be shared with anyone, so the only risk is how it may feel to reflect upon your own thoughts concerning your view of technology integration and learning during a global pandemic.

LINDENWOOD

Research Study Consent Form

Examining Digital Proficiencies Perceptions and Correlation to Achievement

During the Covid-19 Pandemic in a Rural Mid-Western High School

You are asked to participate in a research study being conducted by Tiffany James Young under the guidance of Dr. Jackie Ramey at Lindenwood University. Being in a research study is voluntary, and you are free to stop at any time. Before you choose to participate, you are free to discuss this research study with family, friends, or a physician. Do not feel like you must join this study until all of your questions or concerns are answered. If you decide to participate, you will be asked to sign this form.

Why is this research being conducted?

We are doing this study to analyze how teacher digital proficiency affects student scores in grades 9-12 through the use of a hybrid instructional approach as a result of the global Covid-19 Pandemic. Although research has been completed concerning teacher digital proficiency, technology integration, and hybrid learning, very little of that research has focused on small rural schools in impoverished areas, and almost none of that research has centered on the hybrid instructional approach during a pandemic, due to the fact that the pandemic is still active. Because there has been such little research conducted concerning the location and global pandemic aspects of this study, other comparable districts can learn from this study as they move forward with their own technology integration, including during a hybrid learning approach. We will be asking about 45 other people to answer these questions.

What am I being asked to do?

You will be asked to complete one survey dealing with your perception of teachers' digital proficiencies and their view of technology's role in the classroom. Questions will include items concerning learning in a hybrid approach and also what education is like during a global pandemic

How long will I be in this study?

The survey will take approximately 20 to 40 minutes to complete.

What are the risks of this study?

Privacy and Confidentiality

We will be collecting data that could identify you, but each survey response will receive a code so that we will not know who answered each survey. The code connecting you and your data will be destroyed as soon as possible.

We will be collecting data from you using the internet. We take every reasonable effort to maintain security. It is always possible that information during this research study may be captured and used by others not associated with this study.

What are the benefits of this study?

You will receive no direct benefits for completing this survey. We hope what we learn may benefit other people in the future.

What if I do not choose to participate in this research?

It is always your choice to participate in this study. You may withdraw at any time. You may choose not to answer any questions or perform tasks that make you uncomfortable. If you decide to withdraw, you will not receive any penalty or loss of benefits. If you would like to withdraw from a study, please use the contact information found at the end of this form.

What if new information becomes available about the study?

During the course of this study, we may find information that could be important to you and your decision to participate in this research. We will notify you as soon as possible if such information becomes available.

How will you keep my information private?

We will do everything we can to protect your privacy. We do not intend to include information that could identify you in any publication or presentation. Any information we collect will be stored by the researcher in a secure location. The only people who will be able to see your data are: members of the research team, qualified staff of Lindenwood University, representatives of state or federal agencies.

How can I withdraw from this study?

Notify the research team immediately if you would like to withdraw from this research study.

Who can I contact with questions or concerns?

If you have any questions about your rights as a participant in this research or concerns about the study, or if you feel under any pressure to enroll or to continue to participate in this study, you may contact the Lindenwood University Institutional Review Board Director, Michael Leary, at (636) 949-4730 or mleary@lindenwood.edu. You can contact the researcher, Tiffany James Young, directly at (417) 256-6150 extension 4569 or tiffany.young@zizzers.org. You may also contact Dr. Jackie Ramey at jramey@lindenwood.edu.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.

_____

Student Name (Printed name) **Date**

_____

Parent or Legally Authorized Representative's (Signature) **Date**

_____

Parent or Legally Authorized Representative's (Printed Name) **Date**

_____

Principle Investigator or Designee (Signature) **Date**

LINDENWOOD

Survey Research Consent Form

Examining Digital Proficiencies Perceptions and Correlation to Achievement During the Covid-19 Pandemic in a Rural Mid-Western High School

You are asked to participate in a survey being conducted by Tiffany Young under the guidance of Dr. Jackie Ramey at Lindenwood University. We are doing this study to analyze how teacher digital proficiency affects student scores in grades 9-12 through the use of a hybrid instructional approach as a result of the global Covid-19 Pandemic. It will take about 15-20 minutes to complete this survey.

Answering this survey is voluntary. We will be asking about 10-15 other people to answer these questions.

At the end of the survey, you will be asked if you are interested in participating in an additional interview using open-ended questions that will be presented to you through an online program. You will be asked 11 open-ended questions concerning your thoughts on what has affected student achievement during the Covid-19 Pandemic. These questions should take 15-20 minutes to complete.

What are the risks of this study?

We do not anticipate any risks related to your participation other than those encountered in daily life. You do not need to answer any questions that make you uncomfortable or you can stop taking the survey at any time.

We will be collecting data that could identify you, but each survey response will receive a code so that we will not know who answered each survey. The code connecting you and your data will be destroyed as soon as possible. We do not

intend to include any information that could identify you in any publication or presentation.

Will anyone know my identity?

We will do everything we can to protect your privacy. We do not intend to include information that could identify you in any publication or presentation. Any information we collect will be stored by the researcher in a secure location. The only people who will be able to see your data are: members of the research team, qualified staff of Lindenwood University, representatives of state or federal agencies.

What are the benefits of this study?

You will receive no direct benefits for completing this survey. We hope what we learn may benefit other people in the future.

If you have any questions about your rights as a participant in this research or concerns about the study, or if you feel under any pressure to enroll or to continue to participate in this study, you may contact the Lindenwood University Institutional Review Board Director, Michael Leary, at (636) 949-4730 or mleary@lindenwood.edu. You can contact the researcher, Tiffany Young directly at (417) 256-6150 extension 4569 or tiffany.young@zizzers.org. You may also contact Dr. Jackie Ramey at jramey@lindenwood.edu**.**

By clicking the link below, I confirm that I have read this form and decided that I will participate in the project described above. I understand the purpose of the study, what I will be required to do, and the risks involved. I understand that I can discontinue participation at any time by closing the survey browser. My consent also indicates that I am at least 18 years of age.

You can withdraw from this study at any time by simply closing the browser window. Please feel free to print a copy of this consent for

Appendix H – Safeguard Examples

Confidentiality.

1. Secure all data and documents in a locked cabinet or file under the supervision of the researcher.
2. Save all electronic files by using a protected password and a personal computer on a secured site.
3. Secure audio taped/video recordings in a locked cabinet.
4. All documents and files will be destroyed three years from completion of the research project.

Anonymity.

1. When discussing identifiable statistics, such as student enrollment, free/reduced price meals percentages, or the percentage of specific subgroups of individuals, use approximations or slight modifications.
2. Use data codes or pseudonyms to lessen the possibility of identifying participants.
3. When the sample size is small, participants must be advised there is a possibility one's comments may be recognized even with approximations and modifications in place.
4. Regarding interviews: Once the transcription is complete, the researcher may present the transcript to each participant for review and provide an opportunity for the participant to ask questions or comment before the transcription is finalized.

5. If there is possibility of a conflict of interest between the researcher (who may be a supervisor/administrator) and participants (subordinates/faculty), specific procedures must be set in place, such as a third-party who distributes/collects data, expunges identifying data, and conducts/transcribes the interviews.

Overall.

1. Each participant receives an Informed Consent Form, which describes in detail the purpose of the research, any possible risks, and the opportunity to opt out of the study any time without negative effects.

Vitae

Colleges and Universities

December 2002: Bachelor's degree in Elementary Education from Missouri State University

December 2007: Master's degree in Reading from Missouri State University

May 2017: Specialist Degree in Teacher Leadership from Missouri State University

Teaching History

2003-2008: Classroom Teacher (grades 5,6, and 7) at Ozark Public Schools

2008-2014: Classroom Teacher (7^{th} grade ELA) at Nixa Public Schools

2014-2018: Secondary Instructional Specialist at Nixa Public Schools

2018-2020: Secondary Instructional Coach at West Plains Schools

2020-Present: Coordinator of Secondary Teaching and Learning at West Plains Schools