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A Qualitative Study on Teachers' Perceptions of Virtual Instruction During the COVID-19 Pandemic in a Midwest Public School District

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by

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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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Abstract

During the COVID-19 pandemic, schools closed to in-person instruction and forced teachers and students into virtual learning environments. Schools and districts had to create new ways to deliver curriculum to their students, and most chose to switch to an online/virtual learning environment. In this learning environment, the teachers taught from a distance, and students received their instruction through synchronous and asynchronous methods. This change in content delivery was a new experience for most educators. Teachers worldwide expressed their frustrations with virtual instruction and dissatisfaction with student engagement through social media and mainstream media outlets. The study aimed to determine teachers' perceptions of the virtual learning environment to assess Teacher Efficacy and ideas for possible improvement for that type of learning environment. Participants answered survey questions about teacher self-efficacy, collective Teacher Efficacy, school effectiveness, technology proficiency, and professional development needs through a qualitative study. These survey questions ranged from Likert-type scale and open-ended questions to allow participants multiple ways to express their feelings about teaching in a virtual environment during the COVID-19 pandemic. After analyzing the data, the results indicated that teachers were primarily confident that they could impact student achievement while stressed over the virtual learning environment. They suggested a need for time to plan for virtual learning with their colleagues and focused professional development on the most important digital tools required for virtual instruction.

Keywords: COVID-19, concurrent teaching, asynchronous, educational technology, teacher efficacy

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Chapter One: Introduction

Introduction

The COVID-19 pandemic that began in March 2020 impacted learning tremendously as schools across the nation and the world abruptly switched to distance learning (United Nations, 2020). Suddenly, teachers had to instruct students via a virtual instruction model from home. Districts had to figure out how to provide students with devices and internet access to make learning at a distance possible. Throughout the pandemic, teachers worldwide voiced their thoughts and opinions about virtual teaching on social media or other media outlets. According to NBC news, educators felt they were not reaching their students in the virtual classroom environment, learning was not happening as it should, and both teachers and students experienced an elevated stress level (Ali, 2020). Many teachers have expressed their inadequacy in this new teaching/learning environment; lessons took longer to plan when switching to online classes (Ingra, 2020). This increase in planning can take a toll on Teacher Efficacy in this new learning format due to feeling overwhelmed and unable to address all students' needs at a distance (Team EduTech Post, 2020). Navigating this change has been a struggle during the switch to virtual instruction. In a recent qualitative study conducted through social media platforms, teachers indicated that the transition to distance learning consisted of a lack of student accountability, difficulties communicating with students and families, and stress over balancing everything involved with virtual instruction (Marshall et al., 2020).

While the effects of Collective Teacher Efficacy (CTE) are often debated, and causation is continuously investigated, researchers agree that Bandura’s 1990’s social

cognitive theory is the conceptual foundation and that CTE is based upon collective empirical research, which continues to determine overwhelming positive relationships to learning (Bandura, 1995; Donohoo et al., 2018; Goddard et al., 2000). One example includes John Hattie's research which has shown that CTE has an effect size of 1.36 and is currently the second-highest indicator (previously the highest indicator) of student achievement in the classroom (as cited in Corwin Visible Learning Plus, 2021, Figure 1.1; Donohoo et al., 2018). The higher the effect size number, the higher the indicator positively influences student achievement. Therefore, according to this research, teachers can positively influence student achievement personally and as a whole school entity to ensure student achievement in the classroom. Currently, there is no conclusive answer on how to increase CTE in distance learning environments. Education leaders need more information about ensuring that the CTE is high in the virtual setting. Teachers need to feel like they are being just as effective in a virtual learning environment as in an in-person environment.

Chapter One provides an overview of the qualitative research study regarding perceived teacher effectiveness in virtual learning environments. The researcher discusses the rationale for the study and an overview of the qualitative methodology used in the study.

Rationale and Statement of the Problem

Due to the COVID-19 pandemic, virtual teaching, or distance learning, was necessary to avoid the virus's continued spread. Unfortunately, colleges and universities did not necessarily prepare teachers to teach in virtual settings. However, teachers needed to update their instructional methods to meet all students' needs during this pandemic.

Because virtual teaching was a new concept for most educators, teachers needed professional development and resources on virtual instruction. To determine these needs, the researcher of this project studied the perceived effectiveness of teachers in virtual and concurrent teaching environments in K-12 settings. The research district wanted to discover how teachers felt about the virtual teaching environment and provide them with the professional development and resources they thought they needed. In addition, the research district aimed to increase Teacher Efficacy in virtual instruction. Participants in the study shared their perceptions of the virtual teaching environment and their personal and collective efficacy regarding virtual instruction and student learning.

In the research study school district, the instructional technology specialist and other technology proficient educators trained the teachers on using web tools, such as Zoom, Google Workspace for EDU, Kami, and Screencastify to teach synchronously and asynchronously. Teaching via Zoom and using these digital tools was a new experience for many teachers. Navigating the security permissions and teaching using a webcam and digital tools can be daunting for all educators, especially those who may not be proficient in educational technology tools. The district needed to allow the teachers time to learn the new tools, explore how to use them in the classroom, and ultimately implement them in their virtual lessons. With such a short turnaround from in-person to virtual teaching, training teachers to be virtual teachers was difficult. The district also needed to empower teachers to teach students in this new learning format, which compounded the problem of time constraints and lack of technical proficiency. Due to the quick turnaround to virtual teaching and not knowing how long the pandemic would require virtual learning

environments, it was crucial that the district conduct research to determine what teachers needed to feel effective in distance learning environments.

Not only were students taught temporarily in a virtual setting, but the Missouri Department of Elementary and Secondary Education instituted the Missouri Course Access and Virtual School Program (MOCAP) during the 2019-2020 school year. With guidance from their local school district, MOCAP allowed students to attend school in a virtual environment at the local school district's expense (Missouri Department of Elementary and Secondary Education [DESE], 2020b). This switch to virtual teaching environments, whether temporary or permanent, affected all districts in Missouri.

According to previously conducted research, online learning was less effective for virtual students than for students who participate in onsite learning environments, resulting in lower student achievement (Loeb, 2020). At the September 2021 Missouri Department of Education State Board meeting, the Office of College and Career Readiness delivered a PowerPoint presentation that illustrated the achievement levels of students in the content areas of English Language Arts, Mathematics, and Science. Students in Missouri onsite learning environments scored 47% proficient or advanced on the 2021 state assessment, while students in a virtual learning environment scored 37.8% proficient or advanced on the same state assessment for English Language Arts (ELA) (Missouri Department of Elementary and Secondary Education [DESE], 2021, Slide 18). In math, onsite students scored 39.3% proficient or advanced on the state assessment, while in a virtual learning environment, students scored 22.8% who scored proficient or advanced (DESE, 2021, Slide 18). Furthermore, onsite students scored 39.4% proficient

or advanced for science, and virtual environment students scored 28% proficient or advanced (DESE, 2021, Slide 18).

Given the COVID-19 pandemic and the new Missouri state law regarding virtual instruction, districts need to be aware of what teachers need to teach effectively in a virtual environment to ensure student learning occurs equally among students in onsite and virtual environments. The researcher of the study examined teachers' perceptions of how to prepare teachers to be confident in their teaching environment by examining teachers' perceptions of the virtual learning environment, the professional development required, and the resources necessary to feel effective in that environment. The researcher of the study aimed to guide the district in the future planning of virtual instruction.

Purpose of Study

This qualitative study explored teachers' perceptions of individual and collective skills and attitudes about teaching during the COVID-19 pandemic in a virtual teaching environment. The researcher designed the study to research how teachers adjusted to virtual instruction changes. During the COVID-19 pandemic, which began in March 2020, local school districts and districts worldwide switched to virtual teaching due to schools closing in-person instruction delivery. Teachers suddenly became virtual teachers with little guidance or direction. This second-order change required a complete transformation of how teachers delivered content to students. Months later, educators struggled to understand how to best teach students in a virtual setting (Ali, 2020).

Since virtual teaching is relatively new to the K-12 setting, it is a crucial education delivery method to study. While district leadership provided teachers with the training on this new instructional model, this researcher studied what teachers perceived

they needed to succeed in future virtual instruction settings. Through an online *Qualtrics* survey, the researcher collected data on teachers' perceptions of the effectiveness of virtual instruction and what teachers believed they needed to succeed as virtual instructors. The researcher of this qualitative study collected data relating to overall teacher effectiveness (TE) in the virtual setting, including Teacher Efficacy, Collective Teacher Efficacy (CTE), Teachers' Self-Efficacy (TSE), technology proficiency, and professional development needs.

The results of the study can guide district and school leaders in planning for future online instruction during a pandemic or future curriculum decision. The researcher designed the study to explore differences in teachers' perceptions of effectiveness in a virtual instruction environment. The survey included demographic questions on the data collection tool about the participants' experience in virtual environments and technology proficiency to determine a need for professional development. The survey also included questions regarding best practices for teaching in a virtual environment and resources used within that environment. The researcher also aimed to explore themes of perceptions teachers had while teaching during the COVID-19 pandemic in a Midwest public school district with a population of approximately 5,500 students. The researcher aimed to inform leaders of professional development needs in virtual instruction and technology. The researcher projected that the qualitative research project might impact future research, giving education leaders insight into best planning for unexpected virtual teaching situations.

Conceptual Framework

The researcher aimed to determine the best ways to support teachers in the virtual learning environment to ensure high Teacher Efficacy. Using the interpretivism perspective and qualitative research, the researcher surveyed teachers in virtual environments to understand what was working and what was not. The interpretivism theory allows the researcher to investigate a problem through many different perspectives or stories of those involved in the research study (Butin, 2010). While there may not be one best answer, structuring the research in an interpretivism approach allowed the researcher to gather data from various participants to investigate their perceptions of teacher effectiveness in virtual learning environments to understand better how to plan for the future.

The conceptual idea of Teacher Efficacy, both collective efficacy, and self-efficacy, guided the researcher throughout the research project. Due to the large effect size of CTE (Corwin Visible Learning Plus, 2021), the researcher chose to include collective Teacher Efficacy as a guiding focus of the research. However, many factors lead to collective Teacher Efficacy, including positive teacher self-efficacy, so it was important to research both practices (Kurz & Knight, 2004). Effectiveness occurs at the teacher level and the school level. School Effectiveness (SE), also known as high-reliability schools, leads to higher student achievement (Marzano, 2012), so the researcher included this as a focus of the research study. Through this framework, the researcher aimed to discover how Teacher Efficacy affects the virtual learning environment.

Change theory also guided the researcher during the study. Teaching during the COVID-19 pandemic changed content delivery for teachers and students. According to Bartunek and Moch (1987), third-order change is a type of change that requires professional development on alternative ways of doing things that were previously unknown to implement that change. Using this theory as a guiding force, the researcher sought to understand how the change of instruction model during the COVID-19 pandemic may affect Teacher Efficacy in virtual learning environments.

Research Questions

The researcher investigated what affects K-12 teacher perceptions of TE in the learning environment and designed a qualitative study. The researcher analyzed the following four descriptive research questions to determine common themes that described and explained teachers' perceptions in a virtual environment at a K-12 school district in the Midwest region of the United States.

RQ 1: What are teachers' perceptions of Collective Teacher Efficacy (CTE) in the virtual environment?

RQ 2: What are teachers' perceptions of School Effectiveness (SE) in the virtual environment?

RQ 3: What are teachers' perceptions of Teachers' Self-Efficacy (TSE) on teaching practices in the virtual environment?

RQ 4: What are teachers' perceptions of Teachers' Self- Efficacy (TSE) on technology proficiency and professional development in the virtual environment?

Research Methodology Overview and Nature of the Study

The researcher created a qualitative study based on the four research questions regarding teacher effectiveness in the virtual learning environment. This qualitative study included recruiting participants from a local school district and providing them with a survey to express their perceptions of virtual instruction. The researcher chose the study's research district due to its use of both full-virtual and concurrent virtual settings and being close to the researcher, thereby a convenience sampling of the K-12 virtual instructor population. Because the researcher wanted to understand teachers' perspectives as they instructed students virtually, the researcher chose a qualitative study design. The researcher had no preconceived hypotheses and let the data guide the coding process, a key component of qualitative research design (Creswell, 2009; Heigham & Croker, 2009; Saldana, 2016).

This qualitative study involved collecting data on perceived teacher effectiveness (TE) in virtual settings in grades K-12 and a coding process to develop themes to guide future planning, as described thoroughly in Chapter Three. By focusing on perceived TE as the overarching goal, the researcher created four research questions to determine teachers' perceptions of effectiveness in the virtual learning environment. After the data collection, the researcher analyzed the data and provided recommendations based on that data. Chapters Four and Five detailed the data analysis and provided recommendations for virtual instruction settings and future research on the topic.

Study Limitations and Assumptions

The researcher focused only on virtual instruction and educators teaching in a virtual setting when the researcher administered the data collection tool (survey). Due to

the population included, the study had some limitations. First, the study only included one school district in the Midwest section of the United States, and the researcher only invited virtual instructors in that district to participate. Second, the virtual setup in that district may differ from other districts nationwide or worldwide, thereby limiting its usefulness in different virtual educational settings. The researcher studied virtual instruction only at the K-12 level, possibly limiting its transferability to higher education or early childhood settings. Due to the small number of participants, the demographic questions about age, grade level taught, and teaching experience could be limiting. For example, suppose there was only one teacher with a certain number of years of teaching experience who taught a particular grade level. In that case, the researcher would be limited with data collected regarding that teaching setting. As a result of these limitations, transferring the study results to other virtual environments may not be possible.

The study's assumptions included that the representation of participants would be an accurate sampling of virtual teachers in the research district and that it would represent teachers from all district buildings. However, the researcher had no control over which qualified study participants they invited would choose to complete the survey. The researcher also assumed that the participants would answer the questions on the survey tool honestly, as it related to their experiences as virtual instructors. However, this assumption may not be valid, as participants may have used the survey to express their perceptions of other factors unrelated to the virtual instruction setting.

Definition of Terms

The researcher used the following terms throughout the research study and clarified those terms.

Asynchronous teaching: The teacher delivers content to the students at a time other than a live setting using resources such as pre-recorded videos, podcasts, slideshows, learning management systems, etc. (Finol, 2020).

Collective Teacher Efficacy (CTE): "The collective belief of the staff of the school/faculty in their ability to positively affect students" (Visible Learning, 2018, Figure 1).

***Concurrent teaching*:** An instructional method where teachers use a webcam to deliver content to students via Zoom or other video conferencing tools and simultaneously teach students in the classroom (Tucker, 2020).

Concurrent setting (as used in the research district): An instructional model in the research district where students are both live and in-person simultaneously; the district provided teachers with a laptop, extra screen, video camera, mini-tripod, and a 25-foot cord for the camera for easy movement around the room; teachers used Zoom for video lessons along with using Google Classroom for content delivery.

Digital divide: The gap between the portion of the population in the United States that has adequate access to high-quality internet and internet-capable devices and those who do not (The San Diego Foundation [TSDF], 2020).

Distanced learning (also known as distance learning): "Students are offsite and may receive some instruction online" (DESE, 2021, Slide 7). This official definition from the Missouri Department of Elementary and Secondary Education (DESE) is one way to deliver instruction virtually.

First-order change: Doing something very similar to what has already been done with minor revisions; this type of change does not require training or new learning (Kramer, 2017).

Full virtual setting (as used in the research district): – A full virtual setting in the research district referred to a classroom where the teacher was located at either the assigned school or at home and instructed the students who were at home; the district provided teachers with a laptop, extra screen, video camera, mini-tripod, and a 25-foot cord for the camera for easy movement around the room; teachers used Zoom for video lessons along with using Google Classroom for content delivery.

Hybrid learning: "Students are onsite at least two days per week, with a fixed pattern or receive instruction through a combination of other modes" (DESE, 2021, Slide 7).

Learning Management System (LMS): An online platform of lesson delivery to house all digital resources for the students to use during synchronous and asynchronous lessons (Edwards, 2020).

Open Educational Resource (OER): Free resources, such as public domain, software, online modules, videos, lesson plans, and subject-area content that are open on the internet for all teachers and students to use for learning (Sparks, 2017).

Professional development: Career training or continuing education is provided for employees to learn new skills related to their profession (Antley, 2020).

School Effectiveness (SE): A multi-faceted concept that includes student achievement, leadership behaviors, morale, community and parent involvement/support,

a favorable climate, Teacher Efficacy, and the satisfaction of the teachers who work in the environment (Uline et al., 1998).

Second-order change: Doing something significantly different than anything you have done before, which requires a transformation of the way you have done things in the past (Kramer, 2017).

Synchronous teaching: Teaching students, whether in person or virtually, simultaneously; live instruction (Finol, 2020).

Teacher Effectiveness (TE): A concept built upon the notion that effective teachers have a "direct influence in enhancing student learning" (Tucker & Stronge, 2005, p. 2) in addition to having research-based vital qualities of effective teachers, including being caring, fair, and respectful; having high expectations for not only themselves, but also for their students; use instructional time to maximize student learning; and using assessments to provide timely feedback to students and to inform their instruction (Tucker & Stronge, 2005).

Teachers' Self-Efficacy (TSE): A teacher's belief that they can have a positive effect on student achievement; confidence in their ability to effectively handle the tasks and obligations of the profession and impact student achievement and engagement for all students (Armor et al., 1976; Bandura, 1977; as cited in Tschannen-Moran & Woolfolk Hoy, 2001).

***Technology* tools** (also known as digital tools, online tools, or technology integration): Technologies teachers use in the classroom with students that require electronic devices such as a computer, laptop, and tablet (Moon, 2022). Below are explanations of some of the tools used in the study's virtual/distance learning setting:

- ***Go Guardian***: A program that allows teachers to see which websites each student is currently viewing and can digitally send specific websites to the students that the teacher wishes them to view.
- ***Google Workspace for Education***: A suite of products provided by Google for educators to use in their classrooms with students that include the following:
    - ***Google Classroom***: A learning management system that houses all assignments for students in an online format.
    - ***Google Docs***: Similar to Microsoft Word, this is a word-processing product.
    - ***Google Forms***: A tool that allows teachers to create surveys, quizzes, etc., to administer to students in the classroom or others outside the school, such as other teachers or parents.
    - ***Google Jamboard***: A collaborative digital whiteboard that teachers can use and share with students to draw, type, add digital sticky notes, etc.
    - ***Google Slides***: Similar to Microsoft PowerPoint, a presentation tool to create digital slideshows.
    - ***YouTube***: A video service used to view videos or house videos created by teachers and students.
- ***Kami***: A digital tool for annotating .pdf files.
- ***Screencastify***: A video creation tool to create videos of the computer screen or yourself via the webcam.

- ***Zoom*:** A video conferencing service that allows teachers to teach students who are not in the classroom but attending class remotely.

Third-order change: Change that requires training to implement alternative ways of doing things that were previously unknown before (Bartunek & Moch, 1987).

Virtual teaching/learning: A model of instruction that provides the content to the students via an online environment which should include different experiences than if the instruction was in-person (Meyer, 2020).

Summary

Chapter One introduced the background for this qualitative study that researched educators' perceptions about their teaching in a virtual setting and briefly reviewed how research has shown that Teacher Efficacy (including Collective Teacher Efficacy) is a high predictor of student achievement in the classroom. Chapter One also explained the purpose of the study; the researcher aimed to determine the needs of teachers regarding Teacher Efficacy in a virtual setting to help guide future planning for virtual instruction. The researcher also included a brief literature review that discusses virtual education and the importance of using best practices in various educational settings.

Finally, Chapter One discussed how COVID-19 school closures had impacted teaching throughout the country and across the continents. In Chapter Two, the researcher discussed the shift to virtual teaching worldwide and how people react to and navigate change. The researcher also reviewed the literature on Teacher Efficacy and the possible effects of the COVID-19 pandemic switch to virtual instruction on Teacher Efficacy. Virtual instruction became the norm in districts worldwide, and teachers and students had to adapt to this change in the instruction model, which led to the study's rationale.

Chapter Two: Review of Literature

The COVID-19 pandemic changed how the world taught students, as teachers faced new challenges with virtual teaching. Chapter One focused on the rationale for the study. Chapter Two discusses the literature on education during the COVID-19 pandemic, virtual instruction, Teacher Efficacy, proficiency with educational technology, and navigating change. Through this literature review, the researcher will focus on the main points of the research for the study.

COVID-19 Pandemic and K-12 Education

The COVID-19 pandemic caused schools worldwide to shut down and provide instruction virtually. As a result, education, as previously known, changed for teachers and students. In March 2020, schools shut their doors to teachers, students, and staff prompting educational historians and researchers to find anything similar to this phenomenon in the past (Sawchuk, 2020). A study by the National Council on Teacher Quality in May 2020 reported that 93% of the districts surveyed required that teachers work remotely during the closure (Gerber, 2020, Figure 2). Although nothing quite matched the closure in spring 2020, researchers did say that "long-term impacts for students will be severe, and most likely long-lasting" (Sawchuk, 2020, para. 6). States nationwide canceled annual standardized testing, and teachers and students felt emotional about the situation (Sawchuk, 2020). The closure also exposed the nation to the digital divide in the United States as school leaders struggled to provide students with devices and internet access, for even basic online learning (Sawchuk, 2020). While some affluent districts and private schools provided remote learning without difficulty, due to their

affluent location, many districts had to purchase devices, hotspots, and internet service for the students (Hamilton et al., 2020; Moxley & Delaney, 2020).

In fall 2020, many schools decided to either continue servicing students completely online or provide students the option to come back in person or stay online (Ali, 2020). Some districts even opted to offer hybrid or concurrent classes where teachers would teach students in person and online at the same time (Ali, 2020). This type of teaching, also called hyflex (hybrid/flexible course design), was created by Brian Beatty at San Francisco University, students, and other higher education faculty members worldwide and was designed for use at the college level (Beatty, 2019). However, K-12 districts also began to use the hyflex model of virtual instruction, which caused teachers to feel stress and exhaustion, due to little training and scarce resources to teach in that manner (Ali, 2020). Furthermore, educators spent much time concurrently teaching, "going back and forth between online and classroom students" (Ali, 2020, para. 14), which hindered the actual time the teacher was instructing. In addition to a different way of teaching, many districts/schools nationwide had a mask mandate for the 2020-2021 school year, either as a state-wide mandate or a local decision (Ballotpedia, 2022, Figure 1), including the research district in the study.

Teachers expressed their feelings about the COVID-19 closure and reopening of schools in various ways. Some educators took to social media while others spoke to the news media. According to a study that tracked hashtags on the social network Twitter, between January 21 and May 8, 2020, people posted 80,698,556 tweets, or approximately 66% of the tweets on the platform, about the coronavirus in the English language alone (Chen et al., 2020, Table 5). One teacher posted her resignation letter online and stated

that although she loved her job as a reading specialist, she needed to resign for her well-being (Franchak, 2020). Another teacher told the National Education Association that he was taking a year's leave negotiated through his local union, due to concerns about the COVID-19 virus (Flannery, 2020). Some districts forced teachers to resign due to health concerns surrounding the COVID-19 pandemic (Flannery, 2020). Teachers either did not feel safe about returning to the classroom or had loved ones at risk of catching the virus and becoming severely ill (Flannery, 2020). In addition, the National Education Association polled educators and found that 28% of teachers were considering retiring or leaving the profession early, due to the COVID-19 pandemic, increasing the shortage of qualified teachers in the country (Flannery, 2020, para. 4).

Virtual Instruction

Virtual Instruction is a model of instruction in which the teacher delivers the content to the students through a computer or another electronic device instead of in a face-to-face setting using digital tools for content delivery (Brauner, 2020). During the COVID-19 pandemic, schools suddenly changed to virtual instruction worldwide (Reimer et al., 2021). After the initial COVID-19 closure in the spring of 2020, most districts nationwide reopened the following school year with virtual options available for students who wished to do so and have continued the virtual opportunities in the 2021-2022 school year due to continued fears of the COVID-19 virus (Zalaznick, 2021).

Before the COVID-19 shutdown of schools, virtual instruction still existed. Five states, Michigan, Florida, Virginia, Arkansas, and Alabama, required public high school students to complete one online course as a graduation requirement (Etherington, 2017). The state of Missouri developed the Missouri Course Access and Virtual School Program

(MOCAP) that went into effect in the 2019-2020 school year, which requires all public-school districts to allow students the option of attending virtual courses at the expense of the school district (DESE, 2020b). While the state did not require all students to take an online course in Missouri, the option was available to them if they wished to do so.

The format of online courses can differ significantly. Some courses are synchronous, where the teacher is online teaching while the students join virtually from their own devices, which is very similar to in-person classes (Loeb, 2020). Other online courses meet asynchronously, and the students must complete tasks in the learning management system (LMS) at their own pace while still adhering to assignment due dates (Cardamone, 2020). A sampling of digital tools instructors used for asynchronous learning environments included Open Educational Resources (OERs), pre-recorded video lectures, third-party video resources such as YouTube, and discussion boards within an LMS (GW Instructional Core, 2020). No matter which model of virtual instruction students use, online courses need "a strong curriculum and strong pedagogical practices" (Loeb, 2020, para. 11).

One of the advantages of online learning is taking elective credits during the summer so that students can take more advanced courses during the school year in an in-person setting. Students usually have a more comprehensive range of course options if enrolled in an outside course provider than in their high school location (Etherington, 2017). Another advantage of online learning is enrolling in college-credit courses while attending high school (Etherington, 2017). Most importantly, students enrolled in online classes got experience with technology and LMSs while acquiring the self-discipline required in a self-paced atmosphere (Etherington, 2017).

However, online learning environments also have some disadvantages. One major drawback is that numerous studies have shown that virtual instruction is less effective than in-person instruction (Hart et al., 2019; Loeb, 2020). Online education may be unavailable to those students who lack the required devices or internet connection, which deepens the digital divide, another disadvantage of virtual learning (National Education Association [NEA], 2020). According to a research report by the Rand Corporation, other disadvantages of virtual learning environments include the lack of resources for servicing students with Individualized Education Plans (IEPs), the inability to address the social and emotional needs of students at a distance, privacy concerns of using online digital tools, and providing appropriate instruction and support for English Language Learners (ELLs) (Schwartz et al., 2020).

In a recent study of student satisfaction in virtual learning environments, students indicated that they were most satisfied with online discussion forums, while dissatisfied with PowerPoint slides with just audio for instruction (Hamutoglu et al., 2020). Additionally, students preferred short videos that gave an overview of critical concepts instead of pre-made videos on YouTube, Vimeo, and Khan Academy (Hamutoglu et al., 2020). Another researcher studied a virtual experiential learning model to replace in-person field experiences. In the study site, students met through the online platform Zoom and used Google Maps to familiarize themselves with the area in which the virtual experiences occurred (Cho et al., 2020). Students met with executives in the fashion industry and participated in panel discussions with former university program alums to gain insight into the skills necessary for a job after graduation (Cho et al., 2020). According to the feedback provided by the students, most students were disappointed that

they could not have an in-person experience but appreciated the experiences provided in the virtual environment (Cho et al., 2020). For future virtual instruction, districts must ensure that students are satisfied with their virtual environment to ensure quality learning.

As previously stated, most schools in the United States allowed for virtual and in-person options when schools reopened in the fall of 2020 (Zalaznick, 2021). According to a poll conducted by state departments of education, since the COVID-19 pandemic began in 2020, 38 states in the United States have decided to create permanent virtual schools for students to attend instead of the traditional in-person setting (Gile, 2021). In Missouri, public school districts used three virtual instruction models during the 2020-2021 school year. The virtual model occurred when "students are offsite and receive all instruction online" (DESE, 2021, Slide 8). Distanced learning occurred when "students are offsite and may receive some instruction online" (DESE, 2021, Slide 8). In the hybrid model, "students are onsite at least two days per week, with a fixed pattern, or receive instruction through a combination of other modes" (DESE, 2021, Slide 8).

Table 1

State of Missouri 2020-2021 Distribution of Students by Mode of Instruction

Mode of Instruction	Percentage of Students
Onsite	51%
Virtual	10%
Distanced	8%
Hybrid	31%

Note. Adapted from "Missouri Assessment Program 2020-21 [PowerPoint Slides]" by Missouri Department of Elementary and Secondary Education, 2021, Slide 8.

During the 2020-2021 school year, the state of Missouri collected data regarding the mode of instruction used for students in third grade – high school assessed with the Missouri Assessment Program (MAP), as displayed in Table 1.

As displayed in Table 1, of those students who participated in state testing, 49% received their instruction through a virtual learning model of instruction. Due to the large number of students receiving virtual instruction, the state chose not to use the state MAP data for accountability purposes for the 2020-2021 school year (DESE, 2021).

Virtual instruction relies on access to the internet and a device, such as a computer or a tablet, to deliver the content to students and vice versa (Brauner, 2020). Virtual instruction also relies on an LMS, also referred to as a virtual learning environment (VLE), to deliver the content to the students (Flavin & Bhandari, 2021). During the sudden closure due to the COVID-19 pandemic, districts had to find ways for students to access the online learning content by providing devices and occasionally providing internet access (Berdik, 2020). However, even when providing students with devices and internet service, districts still struggled with virtual instruction during the pandemic because schools tried their best with the digital tools they had (Berdik, 2020). As a result, it took time before districts could figure out the best virtual learning option for students, but they figured it out in the best interest of the students and families of the communities they served (Berdik, 2020).

As stated in the article *Virtual Learning is the Way Forward for Educators*, "We need to stop wishing we were back in a traditional classroom and focus our energy on more powerful learning possibilities and teaching strategies that are now in front of us" (Meyer, 2020, para. 3). Distance or virtual learning environments should not be the same

learning experience as in-person students (Meyer, 2020). Teachers must first decide the "purpose for learning" (Fisher et al., 2021, p. 125). Because students learn differently in virtual learning environments, the teacher needed to plan how they would demonstrate the concepts through either "direct instruction, think-alouds and think-alongs, worked examples, lectures, or share sessions" (Fisher et al., 2021, p. 126). Teachers must also plan how the students will collaborate to improve learning through book clubs, reciprocal teaching, a jigsaw approach, and text rendering (Fisher et al., 2021). The third aspect of an effective virtual instructional model focuses on coaching and facilitating through small group or individual instruction using set prompts and cues to deliver content and to "address errors and misconceptions" (Fisher et al., 2021, p. 143). Finally, teachers should plan a strategy for the students to practice the content taught through deliberate practice, which has an effect size of 0.79 or spaced practice, with an effect size of 0.65 (Fisher et al., 2021, p. 144).

While teachers and schools can plan lessons for virtual instruction, the problem of the digital divide in the United States hinders the ability of schools to deliver that content to all students. According to the National Education Association (2020, para. 2), "25% of all school-aged children live in households without broadband access or a web-enabled device (such as a computer or tablet)." Due to the expense of such devices and of the internet service itself, this limits the access to "native students, rural students, and students of color" (NEA, 2020, para. 3). As a result, many districts used state and federal funding, in addition to private company donations, to purchase devices and hotspots to alleviate the digital divide disparity, which has been extremely helpful for virtual instruction environments (Kamentz, 2020; NEA, 2020).

Teacher Efficacy

Teacher effectiveness (TE) and Teachers' Self- Efficacy (TSE) are subjective terms. As noted in Chapter One, TE is a concept that describes a correlation that effective teachers have a "direct influence in enhancing student learning" (Tucker & Stronge, 2005, p. 2), and TSE is the teachers' belief that they can have a positive effect on student achievement and the confidence in their ability to impact student achievement for all students (Armor et al., 1976; Bandura, 1977; as cited in Tschannen-Moran & Woolfolk Hoy, 2001). However, since the topic of efficacy differs for each teacher, it is essential to let the research guide us and define the term for this research study.

The ultimate goal of the educational system is to ensure that students achieve in the content areas, and teacher efficacy is a strong indicator of student achievement (Thornton et al., 2020). Teacher efficacy is the teachers' belief that they can positively affect student achievement in the classroom (Armor et al., 1976; Bandura, 1977; as cited in Tschannen-Moran & Woolfolk Hoy, 2001). According to Bandura (1995), to "remain task oriented" (p. 6) despite all difficulties or problems, one must have a "strong sense of efficacy" (p. 6). One could conclude that Bandura's (1995) theory of self-efficacy applies to teachers in the classroom, too, as teachers must feel like they are being effective in the classroom so that student learning can occur.

Researchers have tried to measure teachers' sense of self-efficacy in many different ways; however, researchers are continually updating the data collection tools to get a more accurate picture of how teachers feel about their effectiveness in the classroom, as described in Table 2.

Table 2

Various Data Tools for Measuring Teacher Efficacy

Data Tool	Description of Tool
RAND measure (Armor et al., 1976, as cited in Tschannen-Moran et al., 1998)	Two Likert-Scale questions on a 5-point scale
Teacher Locus of Control (Rose & Medway, 1981, as cited in Tschannen-Moran et al., 1998)	28 items with two possible answer choices for each question
Responsibility for Student Achievement (Guskey, 1981, as cited in Tschannen-Moran et al., 1998)	Two choices; two subscales for the responsibility of student success or failure
Webb Efficacy Scale (Ashton et al., 1982, as cited in Tschannen-Moran et al., 1998)	Seven items that ask participants about which statement they feel most strongly
Ashton Vignettes (Ashton et al., 1992, as cited in Tschannen-Moran et al., 1998)	50 items covering situations about "motivation, discipline, academic instruction, planning, evaluation, and work with parents" (Tschannen-Moran et al., 1998, Table 1); rating scales used were self-referenced and norm-referenced
Bandura's Teacher Efficacy Scale	30 items scored on a 9-point rating scale using "Seven subscales: influence on decision making, influence on school resources, instructional efficacy, disciplinary efficacy, enlisting parental involvement, enlisting community involvement, and creating a positive school climate" (Tschannen-Moran et al., 1998, Table 1)

Note. Adapted from "Teacher Efficacy: It's Meaning and Measure" (Tschannen-Moran et al., 1998, Table 1)

University professors and eight graduate students at the Ohio State University developed a new teacher efficacy tool to determine how teachers perceived their effectiveness in the classroom (Tschannen-Moran & Woolfolk Hoy, 2001b). Each group member selected items from Bandura's Teacher Efficacy Scale and created new items not covered in Bandura's scale to create a 52-item tool (Tschannen-Moran & Woolfolk Hoy, 2001b). Narrowing down the items began through group consensus and using the tool

during several studies (Tschannen-Moran & Woolfolk Hoy, 2001b). In their first instrument study, the researchers used a tool consisting of 32 items (Tschannen-Moran & Woolfolk Hoy, 2001b). Through two more studies, the researchers' team reached a consensus on the number of items for their tool (Tschannen-Moran & Woolfolk Hoy, 2001b). Initially titled the Ohio State Teacher Efficacy scale (OSTES), the scale consisted of 24 questions divided into three subsections, or "factors" (Tschannen-Moran & Woolfolk Hoy, 2001b, Table 4). These subsections covered the areas of "instructional strategies," "classroom management," and "student engagement" (Tschannen-Moran & Woolfolk Hoy, 2001b, Table 4). The team also created a short form of their Teacher Efficacy scale consisting of 12 items divided into the same three subsections (Tschannen-Moran & Woolfolk Hoy, 2001b). As utilized in this research study and described further in Chapter Three, previous researchers worldwide used and continue to use these tools (long form and short form), known as the Teachers' Sense of Self Efficacy Scale (TSES), to assess Teacher Efficacy (Tschannen-Moran & Woolfolk Hoy, 2001a). This research study aimed to understand teachers' perceptions of efficacy in the virtual environment, and this tool was essential to understanding teachers' self-efficacy in this research study.

Not only is it crucial for teachers to have self-efficacy in their learning environment, but they also need to have a strong sense of Collective Teacher Efficacy (CTE). Additionally, the researcher of the provided additional study fidelity by adopting the research-based definition of CTE, as described in the Definition of Terms in Chapter One. Visible Learning defines CTE as "the collective belief of the staff of the school/faculty in their ability to positively affect students" (2018, Figure 1). Tschannen-Moran and Barr (2004) define CTE as "the collective self-perception that teachers in a

given school make an educational difference to their students over and above the educational impact of their homes and communities" (p. 190). CTE differs from Teachers' Self-Efficacy (TSE) as it depends on the group of educators working together and believing that all teachers impact student achievement. Previously, researchers considered CTE the highest indicator of student achievement in the classroom (Donohoo et al., 2018; Visible Learning, 2018). In more recent meta-analyses of factors that influence student achievement, CTE now ranks second with an effect size of 1.36; second only to "teacher estimates of achievement," which has an effect size of 1.46 (Corwin Visible Learning Plus, 2021, Figure 1.1). Collective efficacy is such a high indicator of student achievement, because it revolves around a shared vision of all educators who work collaboratively to ensure that every student learns (Donohoo & Katz, 2017). Educators collaboratively working together is the key to CTE. It allows teachers to learn from each other to "build real capability and hence enhance the resolve of teachers that they possess the ability necessary to achieve student learning goals" (Goddard et al., 2015, p. 504). In conjunction with other professional development opportunities, this collaboration provides teachers with multiple ways to focus on any problems that may arise and develop ways to solve those problems (Goddard et al., 2015).

Previous research allowed the researcher to examine instruments used to determine CTE data, as defined in Chapter One of the. For example, to assess CTE, Goddard, Hoy, and Woolfolk Hoy examined various Teacher Efficacy questionnaires and developed a similar Collective Efficacy scale. They reviewed the Gibson and Dembo measure of Teacher Efficacy from 1984 to guide them in developing a tool to assess CTE (as cited in Goddard et al., 2000). While creating this tool, the researchers wrote

questions that covered both group confidence and task analysis and used the same six-point scale as the Gibson and Denbo tool that measures on a scale from strongly disagree to strongly agree (Goddard et al., 2000). They also ensured that they had negatively and positively worded items in both categories for reliability purposes (Goddard et al., 2000). The research team conducted a field test of the scale with six teachers resulting in strong reliability of CTE (Goddard et al., 2000). The team then piloted the tool with a larger sample of 70 teachers from different schools in five states (Goddard et al., 2000). While almost half of the responses were unusable, the team analyzed the remaining responses against other teacher efficacy measures to determine the scale's strong reliability as a tool for determining CTE (Goddard et al., 2000). Prior research convinced this researcher that using the CTE tool emulates best practices, as researchers now use this tool worldwide for assessing CTE in schools.

With the challenges created by the COVID-19 pandemic, the researcher considered that CTE might be low in some schools or districts. For example, researchers Marx and Bloom (2021) suggest that schools increase CTE by building teacher efficacy through professional development. Schools need to rethink how teachers will administer student assessments, and teachers need time to discuss the results of those assessments with colleagues to ensure student success (Marx & Bloom, 2021). Using the data, schools can develop a system to close the achievement gaps caused by COVID-19 school closures and virtual learning environments (Marx & Bloom, 2021). Additionally, the U.S. Department of Education (USDE) suggests that schools keep students face-to-face and minimize virtual learning environments as much as possible (2021b). The USDE also recommends that schools pay close attention to their at-risk populations, such as English

Language Learners (ELLs), students experiencing homelessness, students with disabilities, students of color, and low-income families, to ensure they have the needed digital supplies (2021b). Often, students had to isolate according to COVID-19 quarantine regulations, switch from in-person to virtual learning, and did not have access to the digital learning environment (U.S. Department of Education, 2021b). Schools should also plan to address learning loss and students' and educators' social and emotional needs through the American Rescue Plan funding (U.S. Department of Education, 2021a).

School Effectiveness (SE) is another factor that leads to Teachers' Self-Efficacy (TSE) and CTE. According to Marzano (2012), SE consists of five levels of increasing reliability, as described in Table 3.

Table 3

Levels of School Effectiveness

Level of School Effectiveness	Description of Level
1st Level	"A safe and orderly environment that supports cooperation and collaboration"(Marzano, 2012, p. 2).
2nd Level	"An instructional framework that develops and maintains effective instruction in every classroom" (Marzano, 2012, p. 6)
3rd Level	"A guaranteed and viable curriculum focused on enhancing student learning" (Marzano, 2012, p. 10)
4th Level	"A standards-referenced system of reporting student progress" (Marzano, 2012, p. 14)
5th Level	"A competency-based system that ensures student mastery of content" (Marzano, 2012, p. 16)

Note. Adapted from Marzano's Levels of School Effectiveness (August 2021)

Each level builds on itself, as each level leads to higher reliability of SE through a more transformational approach to ensure student achievement (Marzano, 2012). It is essential for schools to meet the indicators for a specific model, consistently monitor those indicators, and make any necessary changes when schools no longer meet those indicators (Marzano, 2012)

Researchers can determine SE through different means. In addition to Marzano's framework of SE levels (2012), many researchers worldwide use the SE index developed by Hoy (2009). While this index is not a normed assessment, researchers have validated its reliability in numerous educational studies (Hoy, 2009). The most current version of this assessment is an 8-item questionnaire that uses a six-point Likert scale measuring from strongly disagree to strongly agree (Hoy, 2009).

During the COVID-19 pandemic, school leadership is more important than ever to ensure overall school effectiveness. Situational awareness is the top indicator of effective leadership in schools, with a .33 correlation to student achievement (Marzano et al., 2005, Figure 4.1). According to a recent study by Francisco and Nuqui (2020), situational leadership is now the new normal in schools during the COVID-19 pandemic. This type of leadership involves "the ability to be adaptive while staying strong with one's commitment, being an effective instructional decision-maker, and a leader who is a good planner, vigilant, and initiator" (Francisco & Nuqui, 2020, p. 18). To increase student achievement during the COVID-19 pandemic, leaders need to create structures that "build on what children learned (and continue to learn)" (Rigby et al., 2020, p. 6). Schools also need a supportive leader who helps build the processes by which the school functions and trusts the school community, allowing those processes to occur (Donohoo

& Katz, 2017). Responding to the needs of the school members through programs that offer community building and tending to the social-emotional concerns of our students and families is key to producing an effective school community (Rigby et al., 2020).

School leadership with principals/leaders who are transformational change agents is also a high indicator of school effectiveness, with an average correlation of .25 to student achievement, based on the leadership qualities of the principal (Marzano et al., 2005, p. 12). According to Marzano et al. (2005, p. 12), this correlation shows that if the principal's leadership qualities are in the 50th percentile, student achievement will remain the same, but as the principal's leadership qualities increase, so does the academic achievements of the students. Transformational leadership looks at the organization differently and stresses the importance of the needs of the people in the organization (Okoth, 2018). This type of leadership differs from most leadership types, because it is more integrated than a "top-down management approach" (Okoth, 2018, p. 322). As described in Figure 1, school leaders should focus on the 5 Cs of transformational leadership, including clarity, connection, creativity, confidence, and commitment" (Hildebrandt & Mintzer-McMahon, 2020, p. 35).

Figure 1

The 5 Cs of Transformational Leadership

Note. Figure used with permission (Hildebrandt & Mintzer-McMahon, 2020, p. 37); See Appendix I.

The 5 Cs of transformational leadership traits guide school leaders' focus toward a commitment to school effectiveness for the whole school community.

Technology Proficiency and Professional Development

A large part of teacher efficacy in virtual learning environments depends on the educators' understanding of the technology used in such environments (Kamentz, 2020). Providing teachers professional development on technology in the virtual environment can help build technology expertise and teacher self-efficacy (Marx & Bloom, 2021). During the COVID-19 pandemic, the use of technology became imperative for educators. "Online teaching demands that teachers perform the pedagogical role of designing and directing the instruction, facilitating discussion, providing feedback, and navigating learner engagement" (Ogodo et al., 2021, p. 15). However, many districts did not have clear expectations for using technology during the COVID-19 closures in spring 2020

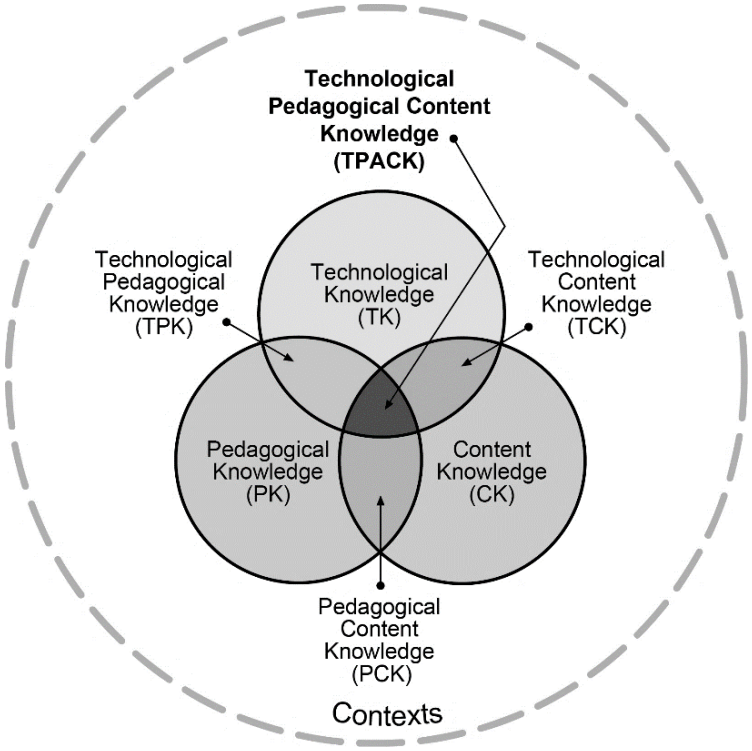
(Gross & Opalka, 2020). In a recent study of 477 school systems in the United States, only 33.5% expected their teachers to provide remote instruction during the COVID-19 closure (Gross & Opalka, 2020, Figure 1). Technology proficiency also was not something that all educators possessed. While teachers may have known how to use a computer in the classroom, it was very different when using the computer to conduct online lessons at a distance. In a 2019 Common Sense Media survey of approximately 1,200 teachers nationwide, researchers determined that technology usage in the classroom can be different from class to class, with video streaming ranking at the top, with 58% of participants reporting that they use that type of technology in the classroom regularly (Vega & Robb, p. 14). In that same report, teachers ranked productivity tools, such as Google Workspace for Education (previously known as GSuite) and Learning Management Systems (LMS) second, with 54% of teachers reporting using those technology tools in the classroom (Vega & Robb, 2019, p. 14). During the school closures in spring 2020, teachers used technology to deliver instructional content to their students. Education Week conducted a nationwide survey of teachers' perceptions of technology proficiency during the COVID-19 closures and found that 46% of teachers felt their use of educational technology had improved a lot during the COVID-19 closure, while 41% of the teachers reported that their use of technology improved a little (Bushweller, 2020, para. 6). However, while many teachers may feel proficient with technology usage in the classroom, they may not be using the technology in innovative ways with appropriate pedagogy to increase student achievement (Wilichowski & Cobo, 2021).

Initially developed by Mishra and Koehler at Michigan State University, TPACK, originally known as TPCK, is a model of technology integration in which pedagogy and content knowledge intertwine with technical knowledge to create a combined understanding of content, pedagogy, and technology best practices (Koehler, 2012; Mishra & Koehler, 2006; Schmidt, Baran, Thompson, Koehler, et al., 2009). Content knowledge (CK) describes the actual content taught by the instructors. In contrast, pedagogical knowledge (PK) is "deep knowledge about the processes and practices or methods of teaching and learning" (Mishra & Koehler, 2006, p. 1026). Finally, technological knowledge (TK) encompasses understanding non-digital and digital resources in the classroom, such as books, chalkboards, word processing and spreadsheet software, operating systems, internet and browsers, email, and peripheral devices (Mishra & Koehler, 2006). Each of these three aspects of the TPACK framework overlap, as shown in Figure 2, to ultimately determine a teacher's proficiency in TPACK, which includes

> the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn, and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones (Mishra & Koehler, 2006, p. 1029).

Figure 2

Technological Pedagogical Content Knowledge (TPACK) Framework



Note. TPACK.org, 2012; Used with permission, see Appendix J.

Many researchers have noted a need for a reliable assessment to determine proficiency in the components of TPACK to understand which professional development approaches can improve teachers' knowledge in the TPACK areas (Mishra & Koehler, 2006). Researchers also needed an assessment to deepen their understanding of which approaches work and which ones do not (Mishra & Koehler, 2006). Researchers at Iowa State University and Michigan State University developed an assessment of TPACK proficiency (Schmidt, Baran, Thompson, Mishra, et al., 2009). These researchers conducted an initial study on the evaluation tool with 124 preservice teachers majoring in early childhood education, elementary education, or other similar fields of study to determine the technology proficiency of educators (Schmidt, Baran, Thompson, Mishra,

et al., 2009). The preservice teachers in the study participated in a 15-week course that focused on technology integration in the classroom (Schmidt, Baran, Thompson, Mishra, et al., 2009). The tool developed by the researchers consisted of 75 questions that were either demographic, measured on a five-point scale from strongly disagree to strongly agree, or an open-ended question for teachers' perceptions (Schmidt, Baran, Thompson, Koehler, et al., 2009; Schmidt, Baran, Thompson, Mishra, et al., 2009). The researchers determined that the initial study population was too small to assess the reliability of the data tool; however accurately, the researchers felt that the results were on the right track for future studies of this assessment tool (Schmidt, Baran, Thompson, Mishra, et al., 2009). Since the initial study, researchers worldwide have conducted additional studies to determine the reliability of the assessment with preservice teachers and practicing educators (Baran et al., 2011; Schmidt, Baran, Thompson, Koehler, et al., 2009).

Another tool to determine technology proficiency is the Technology Integration Confidence Scale (TICS) version 3, developed by Frank C. Gomez, Jr. and aligned to the 2017 International Society of Technology in Education Standards for Educators (Gomez et al., 2021). This tool consisted of 34 items aligned to the seven areas outlined in the ISTE standards: learner, leader, citizen, collaborator, designer, facilitator, and analyst (Gomez et al., 2021; International Society for Technology in Education [ISTE], 2017). To determine validity, the author of this tool had the survey questions examined by "an educational technology professor, a director of technology, a coordinator of technology, a lecturer of education, and a statistician" (Gomez et al., 2021, Methodology section). After examining the survey questions, the researcher initially administered the survey to 118 K-12 teachers from multiple parochial educational settings and followed up with a study

that included a larger population of educators (Gomez et al., 2021). The data from these studies resulted in mean scores between 3 and 4 on a five-point scale, indicating that the participants felt reasonably confident with their use of technology in the classroom (Gomez et al., 2021).

Professional development (PD) on quality instructional practices is crucial to ensuring teacher proficiency in technology use and best practices in the classroom. Before the COVID-19 pandemic, districts provided PD in various ways, the most popular being in-person conferences (Gotian, 2021). During the pandemic, PD had to be virtual, due to social distancing protocols, so district leaders provided quality PD through digital tools, such as Microsoft Teams or another virtual platform (Klein, 2020). Districts needed to focus PD on integrating technology and curriculum needs, while ensuring the PD was engaging with participants (Klein, 2020). The PD also needed to apply to the teachers' current instructional situation (Klein, 2020). Another switch during the pandemic included the freedom for teachers to seek out online PD and experiment with different digital tools (Agnello, 2021). Leaders also encouraged employees to read, participate in podcasts, view videos on YouTube, engage with other peers on social media, and participate in webinars to increase their learning (Gotian, 2021). A Frontline Education study found that between February 2020 and March 2020, usage of an online professional learning platform increased from 600,000 views to 4 million views (Agnello, 2021, para. 4). Similarly, before the March 2020 shutdown, users completed an average of nine learning activities (Agnello, 2021, para. 5). However, that number increased to an average of 24 activities during the two months following the shutdown (Agnello, 2021, para. 5).

One study regarding professional development in the era of COVID-19 focused on creating instructional materials on the COVID-19 pandemic through collaboration. In the study, teachers attended three virtual professional development meetings, an initial meeting, a workshop with design teams utilizing breakout rooms to develop instructional materials, and an asynchronous follow-up using Google Drive to share the resources developed by the teams (Sadler et al., 2020). The researchers determined that flexibility is key to conducting PD online, and collaboration through technological resources like Google Drive allows for quality work to occur (Sadler et al., 2020).

In this age of technological need, preservice teachers need to be proficient in technology. Colleges and universities can help prepare them for what awaits them in the virtual learning environment of our school systems today. A study recently conducted with 63 preservice teachers regarding technology proficiency resulted in a mean score of 4.6 on a six-point scale, indicating that the pre-service teachers surveyed have a moderately high level of proficiency (Kent & Giles, 2017). However, while most participants felt proficient in using technology, they did not feel equipped to choose appropriate technologies for use in the classroom (Kent & Giles, 2017).

To determine a correlation between self-efficacy in the classroom and digital competency, researchers conducted a study using a 16-question survey created by the authors. They administered the online survey in 12 states in the United States, with 109 K-12 teachers completing the survey (Ogodo et al., 2021). The results indicated that those participants who had previously used technology tools, such as an LMS before the pandemic reported high self-efficacy using digital tools (Ogodo et al., 2021). In contrast, teachers who reported low self-efficacy described themselves as having to teach

themselves the LMS and digital tools during the COVID-19 pandemic (Ogodo et al., 2021).

It will depend on the audience and subject when determining which type of PD delivery method to use. District leaders can look to prior studies to guide future PD planning. While many PD sessions have been online due to the pandemic, researchers conducted studies regarding the effectiveness of online professional development before the COVID-19 crisis. In a survey of teachers' perceptions of online PD in a Southeast United States public school district, participants used PD 360, an online professional video platform with over 2,000 training videos for teachers (Powell & Bodur, 2017). The district required the teachers to view at least 10 video modules of approximately 30 minutes each and then respond to reflective questions about the PD provided (Powell & Bodur, 2017). The results of the indicated that the use of an online video platform for PD lacked the personalization that other PD options provide for teachers (Powell & Bodur, 2017).

Navigating Change

The COVID-19 pandemic caused much change in the educational system as teachers and students had to change to a different educational setting (Hamilton et al., 2020). During the switch to virtual instruction in spring 2020, one could theorize that students and teachers adjusted to the change differently. According to change theorists, change has different effects on everyone, and processing change occurs at different rates (Bartunek & Moch, 1987; Lewin, 1947; Norcross et al., 2011).

Navigating change has been a topic of research for decades. Kurt Lewin (1947) researched group dynamics and social change and discussed the differences in social

change between groups. In his theory of "quasi-stationary equilibria in group life and the problem of social change" (Lewin, 1947, p. 13), Lewin stated that some social groups, including work groups, lacked change due to constancy in the group dynamics, while others showed resistance to change. Additionally, Lewin (1947) suggested when a group stays constant, everything stays the same, no significant discord occurs, and the production level remains unchanged. However, when faced with differing degrees of change, or forces, from the constant, the group dynamics can begin to demonstrate resistance to those specific changes (Lewin, 1947). When relating instruction model shifts to virtual teaching, one could hypothesize that current models of instruction worked well for schools or districts as a whole. However, when a significant change occurs within school groups, as in the COVID 19 pandemic shuttering schools, resistance within that setting occurs. Toto and Limone (2021) support Lewin's (1947) change theory as their research shows teachers moving through phases of socio-health, including a rescue phase in which a switch to virtual tools was necessary and ending with a nostalgic phase which is the need to return to what they know. This nostalgic phase is similar to Lewin's (1947) description of resistance to change.

As described by Bartunek and Moch (1987), change occurs in "three different orders of schematic change," including first-order change, second-order change, and third-order change (p. 486). First-order change includes a change that falls into the schemata of present understanding (Bartunek & Moch, 1987). In the educational setting, this may refer to changing class sizes, switching courses to teach, deciding on a new textbook to use with the curriculum, or changing the schedule for the day (Kramer, 2017). Second-order change requires some "modification of present schemata" for change

to occur, meaning that one "set of schemata is phased out as another is phased in" (Bartunek & Moch, 1987, p. 486). This type of change may involve creating an intervention process for students or implementing a new school system of supports for students (Kramer, 2017). Finally, third-order change requires training to create a new schema to implement alternative ways of previously unknown things (Bartunek & Moch, 1987). Using the change theory proposed by Bartunek and Moch (1987), it appears that teaching in a new virtual setting with students during the COVID-19 pandemic is a third-order change for educators. Due to the pandemic, teachers needed to change overnight to virtual teaching without the proper training required in virtual learning environments. At the same time, many of them also had to help their own children with online learning (Team EduTech Post, 2020). This sudden change led to high stress for educators (Pressley et al., 2021; Team EduTech Post, 2020).

Marzano et al. (2005) discussed change theory in their work with school leaders, but categorized second-order change as a type of change members of the school community could resist, due to feelings that the school does not have the resources for such a change. Using this theory, educators experienced second-order change during the COVID-19 pandemic. This theory differs somewhat from Bartunek and Moch's (1987) third-order change description, as it does not describe change regarding previously unknown things. Instead, change theory focuses on the resources needed to make the change possible (Marzano et al., 2005). This change theory may be relevant for educators, due to the change of instruction model and many schools and districts not having the resources to support such a change.

Norcross et al. (2011) proposed that people undergo five stages of change. These stages include precontemplation, contemplation, preparation, action, and maintenance, which shows the progression of starting with no intention of changing to maintaining the change over time (Norcross et al., 2011). In a meta-analysis of inpatient and outpatient treatment studies involving these stages of change, researchers theorized that it is essential that an individual's readiness for change depends on how each individual will respond to that change, or in other words, how they will transition through those five stages of change (Norcross et al., 2011). Another recommendation developed from the meta-analysis states that individuals need to "set realistic goals by moving one stage at a time" (Norcross et al., 2011, p. 151). The meta-analysis results warn that not all people going through change will seek treatment or remain in therapy since they are not yet in the stage of change that will allow them to act on the changes in their lives (Norcross et al., 2011). Since these stages can apply to any situation involving change, including changing from teaching all in-person classes to teaching virtually, one can assume that educators have been going through these stages of change at different times, depending on their situation as virtual instruction continues to evolve. Some are ready to act on the change, while others resist moving through the stages.

A study conducted on organizational change during the pandemic covering occupations from more than 20 industries, including education, indicated that participants had high levels of uncertainty and confusion with changes at the organizational level, due to the COVID-19 crisis (Li et al., 2021). The researchers of that study also found that although some communication regarding change was transparent, participants' coping strategies varied in response to the change (Li et al., 2021). However, a more positive

relationship with coping strategies occurred when communication was apparent between the organization leaders and the employees (Li et al., 2021). In a similar study, researchers studied the perceptions of organizational support during the pandemic and concluded that employees display positive emotions toward change when they feel supported by the organization (Sun et al., 2021). In a study exclusively focused on teachers' attitudes toward change during the COVID-19 pandemic, researchers discovered that teachers' stress levels significantly impact their perceptions toward change (Sokal et al., 2020). In the of 1,626 teachers, researchers also concluded that teachers' positive beliefs and attitudes decreased significantly between April 2020 and June 2020, leading to possible burnout (Sokal et al., 2020). Additionally, previous studies found that working from home using digital technology tools can cause "feelings of tension, anxiety, exhaustion, and decreased job satisfaction" (Cuervo et al., 2018, as cited in Ozamiz-Etxebarria et al., 2021, pg. 2). During the COVID-19 pandemic, teachers could only teach virtually through the means of these digital tools, which may have led to stress and anxiety amongst teachers (Ozamiz-Etxebarria et al., 2021).

Researchers conducted numerous studies worldwide to determine if teachers' social-emotional well-being was a concern during the shift of instructional models during the COVID-19 pandemic. In a fall 2021 study with 359 district leaders in the United States, 56% of those in the study said that the mental health of their teachers was a primary concern, and 31% said it was a moderate concern (Rand Corporation, 2022, Question 10). Another study that surveyed teachers in 16 states in the United States discovered a high correlation between teachers that indicated high anxiety about teaching during the pandemic and changing to using only digital tools and teaching in a virtual

environment (Pressley et al., 2021). A study conducted in Spain and Mexico with 421 teachers who completed an online survey indicated that the psychosocial risks of teaching during the pandemic were high; however, it also revealed that overall, the teachers in Spain scored it as a higher risk factor than those in Mexico (Prado-Gasco et al., 2020). The Christensen Institute sponsored a different study with 1,074 administrators and teachers from 49 states and the District of Columbia in the United States, which determined that 78% of respondents disagreed with the statement that "I have very little work-related stress" (Arnett, 2021, p. 10). Some comments from the participants included,

> Balancing in-person learning with those who are in quarantine at home learning has been trying to the staff. There has been a huge increase in the number of students in quarantine for 20 school days. Providing them with online work is a huge project and feels like a second full-time job. Most teachers feel like zombies just going through the motions of the day. The workload is unreal. The pressure on teachers during this time is more than ever before. (Arnett, 2021, p. 13, 15)

This research regarding the change to virtual instruction leads to the conclusion that this change increased teachers' stress levels and social-emotional health.

Summary

Due to the COVID-19 pandemic, schools worldwide had to shut down and change their methods of instruction. Districts had to quickly switch to an online instruction model and provide the devices and internet to the students and teachers to make this model work. This sudden change in the teaching model caused educators to voice their opinions through social media and other media outlets. Teachers were frustrated during

the spring 2020 closure, and when the new school year started, many teachers were still voicing frustrations.

Virtual instruction options continued in many districts worldwide throughout the 2020-2021 school district. However, many districts did not adequately train educators to teach at a distance, which caused difficulties in the educational structure. It was essential for districts to give grace when instructing in an unfamiliar setting during the COVID-19 pandemic. Schools and districts can learn from previous research on teacher efficacy, navigating change, virtual instruction, and technology proficiency for educators in K-12 settings to guide future instruction in virtual environments.

Teachers' perceptions of effectiveness and technology play a crucial role in teacher efficacy in the virtual classroom setting. In Chapter Three, the researcher discussed the research study conducted to determine teachers' perceptions of CTE, school effectiveness, self-efficacy, and technology proficiency/professional development needs in the virtual learning environment. After reviewing the literature surrounding the aspects of virtual teaching, efficacy, and change, the researcher learned more about what teachers need to feel successful in such a setting.

Chapter Three: Research Method and Design

Introduction

The COVID-19 pandemic began with schools closing in the United States in March 2020, which continued throughout the country and worldwide. For example, on July 1, 2020, Education Week reported, "Eventually, 48 states, four U.S. territories, the District of Columbia, and the Department of Defense Education Activity ordered or recommended school building closures for the rest of their academic year, affecting at least 50.8 million public school students" (para. 1).

While most schools reopened in the fall of 2020, virtual instruction was still an option for students in many schools or districts (Zalaznick, 2021). Since virtual learning in the K-12 setting was a new concept for many educators (Ali, 2020), especially teaching through a pandemic, the researcher aimed to determine teachers' perceptions of efficacy in the virtual learning environment during the 2020-2021 school year. Additionally, the researcher sought to understand the needs and perceptions of teachers in virtual learning environments to guide the research district in future planning for virtual instruction through a qualitative research study design.

Chapter Three includes a synopsis of the purpose of the study, followed by an explanation of the research design, which included a researcher-created qualitative survey designed to investigate educators' perceptions of teacher effectiveness (TE) in the virtual learning environment, distributed to virtual instructors in the research district. The researcher includes a table displaying the study sites' demographics and an explanation of the steps used to recruit study participants. Next, the researcher reintroduces the research

questions and explains the procedures used to analyze the survey results through qualitative data analysis.

Purpose

While teachers knew how to use best practices for in-person learning environments, teachers did not necessarily understand the skills necessary for teaching in a virtual environment. In addition, little research regarding virtual teaching during a global pandemic existed, making investigating quality research on the topic challenging, as noted in Chapter Two. Therefore, due to a lack of research and uncertainty regarding the implementation of virtual instruction, the researcher created a qualitative study to determine teachers' efficacy and needs in virtual learning environments.

The researcher created a survey instrument containing Likert items, Likert-type scales, and open-ended questions to collect qualitative data from virtual instructors in the research district. Following the data collection, the researcher developed themes to guide future planning for the research district through data analysis and coding.

Qualitative Research Design

The qualitative research design focused on the interpretivism theoretical framework (Butin, 2010), as the researcher aimed to discover the perceptions of teacher efficacy in virtual learning environments. The framework allowed researchers to "thoroughly document the perspective being investigated" (Butin, 2010, p. 60), which is the purpose of the study regarding virtual instruction.

While limited research on virtual teaching in a pandemic existed to prepare educators for instructing students during the COVID-19 pandemic, educational strategies utilizing best practices should still be evident in virtual classrooms. According to the

Global Research Database, Collective Teacher Efficacy (CTE) was the second-highest predictor of student achievement, with a 1.36 effect size (Corwin Visible Learning Plus, 2021, Figure 1.1). In addition to CTE, teachers must feel capable of teaching independently, also known as teacher self-efficacy (TSE) (Tschannen-Moran & Woolfolk Hoy, 2001b).

The researcher developed the study to learn more about CTE and TSE in virtual teaching environments because of the relevance of TE in virtual settings. The researcher wanted to hear from teachers working in virtual classrooms to determine teacher perceptions of virtual instruction. Therefore, the researcher recruited current virtual teachers who then participated in a qualitative survey to express unique perspectives of the virtual learning environment. Through the qualitative survey, teachers expressed views on the virtual learning environment regarding TE, including CTE, School Efficacy (SE), TSE, technology proficiency related to virtual instruction, and professional development needs. The information gained from the study aimed to assist in planning best practices for virtual education in the research site district.

Research Questions

The researcher investigated teacher perceptions of TE in the virtual learning environment. The researcher analyzed the survey results aligned to the following four research questions to determine common themes that describe and explain teachers' perceptions of working in a virtual learning environment at a PreK-12 school district in the Midwest region of the United States.

RQ 1: What are teachers' perceptions of Collective Teacher Efficacy (CTE) in the virtual environment?

RQ 2: What are teachers' perceptions of School Effectiveness (SE) in the virtual environment?

RQ 3: What are teachers' perceptions of Teachers' Self-Efficacy (TSE) on teaching practices in the virtual environment?

RQ 4: What are teachers' perceptions of Teachers' Self-Efficacy (TSE) on technology proficiency and professional development in the virtual environment?

Research Site and Study Population

The qualitative research study took place in a suburban school district in the Midwest region of the United States. The school district consisted of approximately 5,000 students in grades PreK through 12th grade who provided instruction in 13 school buildings, including one early childhood center, six elementary schools, two intermediate/middle schools, two high schools, and two alternative education buildings (Missouri Department of Elementary and Secondary Education [DESE], 2020a; National Center for Education Statistics, n.d.). The research district only offered a virtual instruction option to students in Kindergarten through 12th grade (PreK students were not provided virtual instruction) in the 2020-2021 school year. The district's student population included diverse races, students with special needs, and students receiving free or reduced lunch, as described in Table 4. Although the researcher did not include the demographics of the students in the data analysis, it is crucial to understand the district make-up to understand the teachers' perceptions of the virtual instruction setting in the research district.

Table 4

Kindergarten -12th Grade Student Population of Research District 2021

Category	Percentage of Students
American Indian/Alaska Native	0.1%
Asian	2.2%
Black	13.7%
Hawaiian/Pacific Islander	0.1%
Hispanic	10.5%
Multi-Race	7.0%
White	66.4%
Free and Reduced Lunch	28.6%
English Learner	4.4%
Special Education	17.9%
Homeless	0.8%
Gifted	6.6%

Note. Adapted from "District report card" by Missouri Department of Elementary and Secondary Education, 2021, Section 3.

Participant Recruitment

The researcher recruited the participants by email through the Lindenwood email service. The recruitment email provided a link to the survey using *Qualtrics*, a secure, online data collection tool used by the study's researcher. The survey included the informed consent form explaining that the participants could discontinue the survey at any time and therefore choose to leave the research study. The researcher also explained in the informed consent form that participants could also contact the researcher to opt out of the study after completing the survey. Although 49 teachers completed the informed consent, 41 teachers participated in the research study district-wide.

Due to the COVID-19 pandemic, the research district offered two types of virtual settings for students, full virtual (grades K through 8) and concurrent (grades 5 through 12). In a completely virtual environment, all students learned at home, and the teacher taught the students using the Zoom video conferencing program and some asynchronous activities, such as videos, Google Slideshows, and online worksheets. The concurrent virtual setting included both in-person students and students learning from home via Zoom, taught simultaneously by the same teacher.

The participants in the study were all educators in the research district who taught in one of the two virtual settings provided for students. The participants also had to teach in a virtual learning environment for the entire 2020-2021 school year. Since some students switched back to in-person for the second half of the school year, teaching assignments changed. The researcher disqualified teachers from participating in the study who only taught half the school year as virtual teachers, due to a possibility of skewing the survey results, as those teachers would have been teaching in an in-person setting for several months before the researcher distributed the survey. Ten fully virtual teachers and 31 teachers who taught in concurrent settings participated in the study. Before becoming virtual teachers, some participants had experience in virtual learning environments, either as a teacher or a student, while others had no experience, as shown in Table 5.

Table 5

Participants' Experience With Virtual Learning

Experience With Virtual Learning	# of Participants
Previous experience	17
No previous experience	24

The participants' ages and years of teaching experiences varied, as did the grade span taught, as shown in Tables 6 and 7.

Table 6

Participants' Grade Span Taught

Grade Span	# of Participants
Elementary School Teachers (K through 4)	6
Intermediate/Middle School Teachers (5 through 8)	11
High School Teachers (9 through 12)	23
Other/Not Specified	1

Table 7

Participants' Ages and Teaching Experience

Category	# of Participants
Ages 22 to 30	4
Ages 31 to 35	6
Ages 36 to 40	8
Ages 41 to 45	3
Ages 46 to 50	8
Ages 51 to 55	1
Ages 56 to 60	3
Age not provided	8
1 to 3 years of teaching experience	3
4 to 6 years of teaching experience	4
7 to 10 years of teaching experience	6
11 to 15 years of teaching experience	11
16 to 20 years of teaching experience	4
Over 20 years of teaching experience	13

Data Collection

The data collection tool used in the research study was a combined questionnaire with open-ended questions and a survey with a Likert item rating scale and Likert-type scale questions (see Appendix A). In addition, the researcher created some open-ended questions about technology needs and professional development, so the research district could understand the overall needs of virtual teachers. The researcher gained permission to use any questions from published surveys, if necessary, as noted in Table 8.

For consistency purposes in the research study, the researcher named the data collection tool a survey created in *Qualtrics* and emailed the survey to potential participants, virtual teachers in the research district, to explain the purpose of the study in detail. The survey allowed the participants to provide perspectives on teacher efficacy, technology proficiency, technology tools, and professional development. The researcher's purpose was to determine themes regarding the specific needs of the virtual teachers in the research district.

Table 8

Data Collection Tool Alignment to Research Questions

Question #s	Alignment to Research Questions or Demographic Information	Alignment to Research-Based Surveys/Questionnaires
1, 2, 3, 4, 5	Demographic Information	N/A
6	Definition of Effective Instruction	N/A
7	RQ 1 and RQ 2	Collective Efficacy Scale (Goddard et al., 2000), permission for use granted by Dr. Roger Goddard; School Effectiveness Index (Hoy, 2009), open-source survey instrument
8	RQ 3	Teachers' Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001a), permission for use granted by Dr. Anita Woolfolk Hoy
9	RQ 2	Distance/Hybrid Learning Survey (Panorama Education, 2020), permission granted for use by Tina-Marie Lohela, Panorama Education
10	RQ 3	Distance/Hybrid Learning Survey (Panorama Education, 2020), permission granted for use by Tina-Marie Lohela, Panorama Education
11, 12	RQ 2 and 3	Distance/Hybrid Learning Survey (Panorama Education, 2020), permission granted for use by Tina-Marie Lohela, Panorama Education
13	RQ 4	Distance/Hybrid Learning Survey (Panorama Education, 2020), permission granted for use by Tina-Marie Lohela, Panorama Education
14	RQ 4	Technological Pedagogical and Content Knowledge Survey (Schmidt, Baran, Thompson, Mishra, et al., 2009), permission granted for use by Dr. Denise A. Schmidt-Crawford
15, 16, 17	RQ 4	N/A
18	RQ 1, 2, 3, and 4	N/A

Note. Table 8 is a researcher-created table that organizes survey questions showing research question alignment and citations for survey instruments used in the study.

The researcher collected all data through the secure, online *Qualtrics* survey program. The researcher analyzed the data without preconceived prejudices toward known participants or the data itself. The participants signed an electronic consent form, which allowed participants to advance to the survey. The researcher hid the informed consent answers from view in the *Qualtrics* program during the data analysis for anonymity purposes. The researcher downloaded the anonymous results of all questions that were either demographic data or aligned to the research questions to a secure, university-owned Microsoft One Drive. Since the survey was anonymous, the downloaded results did not have any identifying information attached, so the researcher did not know the survey answers of individual participants.

Reliability and Measurement

The researcher created the survey tool in *Qualtrics* for security purposes. To create a reliable data collection tool, the researcher aligned the survey to the research questions for the study and used research-based data collection tools in addition to developing specific questions regarding the research district. The instrument consisted of open-ended and closed-ended (rating scale and Likert scale-type) questions. The researcher used open-ended questions to allow the participants to freely write about the virtual teaching experience to explore the topic in detail and provided the opportunity to explain individual perceptions to the researcher for clarity (Sauro & Lewis, 2021). The researcher also used rating scales and Likert scale-type questions to quantify the participants' perceptions (Elliott, 2021; McLeod, 2019) regarding TE to determine levels of perceived teacher efficacy for thematic analysis purposes.

Most of the data collection tool (survey) questions came from research-based data

collection tools for reliability, as shown in Table 8. More specifically, the researcher included the Collective Efficacy (CE) Scale (Goddard et al., 2000) collection tool to understand how teachers viewed the efficacy of the school community in which they worked. The researcher also included questions from the School Effectiveness Index (SEI) (Hoy, 2009) to determine teachers' overall perceptions during remote learning in the schools in the research district. Another tool used was the Teachers' Sense of Efficacy Scale (TSES) (Tschannen-Moran & Woolfolk Hoy, 2001b), allowing teachers to rank perceived self-efficacy levels related to virtual instruction. The survey also included questions from the Technological Pedagogical and Content Knowledge Survey (TPACK) (Schmidt, Baran, Thompson, Mishra, et al., 2009) to determine the teachers' perceived technology proficiency. Finally, the researcher used questions from the Distance/Hybrid Learning Survey (Panorama Education, 2020) to determine teachers' perceptions of the virtual learning setting. While the researcher did not use the tools in their entirety, the chosen questions aligned with the researcher's research questions. The remaining questions on the survey included inquiries related directly to the virtual learning environment of the research district. The researcher created open-ended questions geared toward technology provided by the district, teacher needs regarding technology, and perceived growth achieved during the school year.

Data Analysis Procedures

After collecting the survey data, the researcher analyzed the data using the thematic analysis method; where a researcher "captures something important about the data in relation to the research question and represents some level of *patterned* response or meaning within the data set" (Braun & Clark, 2006, p. 82). Then, the researcher began

the coding process with open coding of the data. Open coding is a process by which the researcher codes the data in loose or general categories meant to be "tentative and subject to evolve and change as you code in further rounds" (Delve, 2020, section 6). Next, the researcher reviewed the data in Excel spreadsheets and color-coded those patterns according to patterns that emerged to highlight the similarities in the data responses (Delve, 2020). Saving the Excel spreadsheet on the password-protected research university's Microsoft One Drive allowed for secure storage of data and the ability to share the data with the researcher's committee chairperson if requested. After the open coding process, the researcher reviewed the data and provided thematic analysis coding by noting the data's themes. The researcher used thematic analysis coding to analyze qualitative data to identify patterns that emerged to make sense of the data (Braun & Clark, 2006; Delve, 2020). Since qualitative data revealed no actual numerical data, the researcher used good judgment and determined the themes based on the coding (Braun & Clark, 2006). Using the coding process, the researcher reviewed the open-ended questions' data, downloaded the participants' responses into Excel spreadsheets, and stored the spreadsheets on the research university's Microsoft One Drive. Then, the researcher looked for similar words and phrases and highlighted each within the spreadsheet. Each time the researcher determined a similar word or phrase, the researcher highlighted the word or phrase with the same color. The researcher continued looking for similar words and phrases by highlighting related concepts with the same color. Next, the researcher continued the process for each of the open-ended questions. Since some of the questions aligned to more than one research question, the researcher used good judgment in determining which answers best aligned with each research question.

After highlighting the open-ended question responses, the researcher calculated the results of the Likert-type scale questions according to the scoring guides of the research-based tools sampled in the survey (see Table 8) to determine mean scores. Using the mean scores allowed the researcher to determine which questions scored the highest or lowest to determine teachers' perceptions accurately. In addition, to mean scores, the researcher also calculated the mode, when applicable, as an additional data set for comparison purposes. Next, the researcher determined more similarities in the data and developed themes using results from those questions and highlighting likeness in answers. Finally, the researcher demonstrated the research process by coding and organizing data into tables and graphs.

Ethical Considerations

The researcher completed the study with some participants also identified as an acquaintance. Having acquaintances who participated in the study was a potential ethical concern as unanticipated bias might have interfered with the participants' answers or the researcher's analysis. To minimize risks of biased analysis or any other possible issues, the researcher conducted all correspondence with participants through the Lindenwood email server instead of the research district's email server. Additionally, the researcher used the research study site's secured *Qualtrics* system to create and collect the data. Participants signed the required informed consent through *Qualtrics*. The consent forms were separate from the individual results on the *Qualtrics* server, so the data for each question was anonymous when reviewed by the researcher. The data remained on the secure *Qualtrics* survey for the required length of three years after the researcher completed and defended the dissertation. After completing the degree and the three-year

time requirement, the researcher deleted the survey and results from the *Qualtrics* system.

The researcher analyzed the results by downloading files from the *Qualtrics* server and storing the files on the researcher's secure, password-protected University Microsoft One Drive. The researcher deleted all data stored on the server after the three-year requirement. The researcher also logged coding data from printed files on an Excel spreadsheet and saved the data on the research university's Microsoft One Drive secure server. The researcher stored the printed files in a locked file until transferred to the Excel spreadsheet. Once the researcher transferred the files, the researcher shredded the printed files for privacy.

Limitations to the Study

The researcher conducted a qualitative study in one PreK-12 district in a suburban town in the U.S. Midwest region. The participants were all virtual teachers in grades K through 12. PreK teachers did not participate in virtual instruction during the 2020-2021 school year and therefore did not participate in the study. Furthermore, the researcher focused the study on teaching during a global pandemic (COVID-19) in two different virtual settings, including a full-virtual and a concurrent-virtual environment. While virtual teaching was not an original concept, teaching during a pandemic was. Due to the research study setting, participant pool, and pandemic teaching parameters, this limits the study's transferability to other educational settings.

The researcher collected digitally signed consent forms from 49 participants through the secure *Qualtrics* program. However, 41 participants participated by answering the survey questions. As the survey proceeded, the survey received fewer responses to various questions. However, all questions in the survey were optional, and

the survey was anonymous. Because all questions were optional, the researcher could not determine which demographics of participants answered each question, which created a study limitation. Due to this limitation, the participants' demographic data was not clearly defined and not represented in the survey analysis.

Summary

The research study occurred in a suburban area in the Midwest United States that offered full virtual and concurrent learning environments. The qualitative research design investigated teachers' perceptions of virtual learning environments. The research coded the data using open coding and thematic coding to determine teachers' perceptions. The coding process involved color-coding similar data in Excel spreadsheets and reviewing the codes to determine themes during the analysis. Emerged themes from the data allowed the researcher to draw conclusions and provided suggestions for future planning of virtual instruction in the research district.

Chapter Three reintroduced the study's four qualitative research questions and described the methodology of the data collection survey tool, which collected data through a secure *Qualtrics* survey. Then a brief methodology review was discussed, explaining how the data aligned with the research questions. Next, the researcher provided examples of the organized data in tables and graphs to visualize the similarities and differences. Finally, the researcher described the data method used to code the data to create qualitative themes. Chapter Four demonstrated how the researcher used the methodology described in Chapter Three and included the results of the qualitative study in detail. Also, in Chapter Four, the researcher explained the analysis of each research question using the survey data to determine themes.

Chapter Four: Analysis

Introduction

As stated in Chapter Three, the researcher of the study aimed to determine teacher effectiveness (TE), as defined in Chapter One, in virtual learning environments. However, effectiveness can mean different things to different people. Hence, it was essential for the researcher to decide what the word effectiveness meant in the minds of the study participants. Therefore, the researcher asked the participants to define what effective instruction meant to them as a basis for answering the remaining questions in the survey. According to the participants' responses regarding effective instruction, two themes emerged, which included students mastering content skills and teachers meeting the needs of every student in the classroom. Both themes became the overarching focus of teachers' perceptions of effectiveness in the virtual setting.

Research Questions

The researcher investigated K through 12th grade teacher perceptions of TE in the virtual learning environment. The researcher analyzed the following four descriptive research questions to determine common themes that described and explained teachers' perceptions of effectiveness in a virtual environment at a PreK through 12th grade school district in the United States.

RQ 1: What are teachers' perceptions of Collective Teacher Efficacy (CTE) in the virtual environment?

RQ 2: What are teachers' perceptions of School Effectiveness (SE) in the virtual environment?

RQ 3: What are teachers' perceptions of Teachers' Self-Efficacy (TSE) on teaching practices in the virtual environment?

RQ 4: What are teachers' perceptions of Teachers' Self-Efficacy (TSE) on technology proficiency and professional development in the virtual environment?

Results

While 49 virtual instruction teachers completed the informed consent form, 41 participated in the study by answering the questions on the survey. However, not all responded to every question, as all survey questions were optional. The researcher determined the themes in the study through the open coding and thematic coding analysis processes. Additionally, the researcher analyzed the Likert scale and open-ended questions and coded for themes to determine the teachers' perceptions of the effectiveness of virtual instruction in the research district.

Research Question 1

Research Question 1 allowed the researcher to determine teachers' perceptions of CTE in the virtual environment. Since CTE is such a high indicator of student achievement (Corwin Visible Learning Plus, 2021), the researcher determined it was essential to determine teachers' perceptions of CTE in the virtual learning environment. The researcher used questions from the CE Scale (Goddard et al., 2000), which used a six-point scale ranging from strongly disagree to strongly agree to determine the CTE at the research district related to the virtual teaching environment. The researcher selected questions from the CE scale most aligned to the research questions to focus the research and make the complete survey manageable for the participants. The researcher instructed the participants to answer each survey question related to the virtual instruction

environment. The researcher calculated the item total for each question by multiplying the total responses for each category by the points for the scale, based on a six-point scale (Goddard et al., 2000). The higher the item total, the higher the CTE (Goddard et al., 2000). Three questions from the CE Scale were written negatively and required the points to be scored in reverse to determine the item total (Goddard et al., 2000) (see Table 9, questions 3, 4, and 7). The researcher did not average the scores for a school-wide collective efficacy score, since all participants came from different schools throughout the research district. It is impossible to determine a district-wide CTE score, since the participant pool is small and does not necessarily represent teachers from every building and grade level. However, the researcher calculated the total possible points for each item district-wide to be 228 for comparison purposes for the study.

Based on the results of the CE scale shown in Table 9, the researcher determined the highest sense of CTE related to the teachers' skills in the classroom and the beliefs that every child can learn, as supported by the participants' definition of effective teaching.

Table 9

Collective Efficacy (CE) Scale

Question	% Strongly Disagree, Disagree or Somewhat Disagree	% Strongly Agree, Agree, or Somewhat Agree	Item total	# of Participants That Answered the Question
1. Teachers in this school are able to get through to the most difficult students.	21.1%	79.0%	160	38
2. Teachers here are confident they will be able to motivate their students.	23.7%	76.3%	163	38
3. If a child doesn't want to learn, teachers here give up.	84.2%	15.8%	187	38
4. Teachers here don't have the skills needed to produce meaningful student learning.	94.7%	5.3%	203	38
5. Teachers in this school truly believe that every child can learn.	7.9%	92.1%	196	38
6. These students come ready to learn.	34.2%	65.8%	146	38
7. Teachers in this school do not have the skills to deal with student disciplinary problems.	76.3%	23.7%	180	38

Note. Questions from the CE Scale (Goddard et al., 2000) were used with permission;

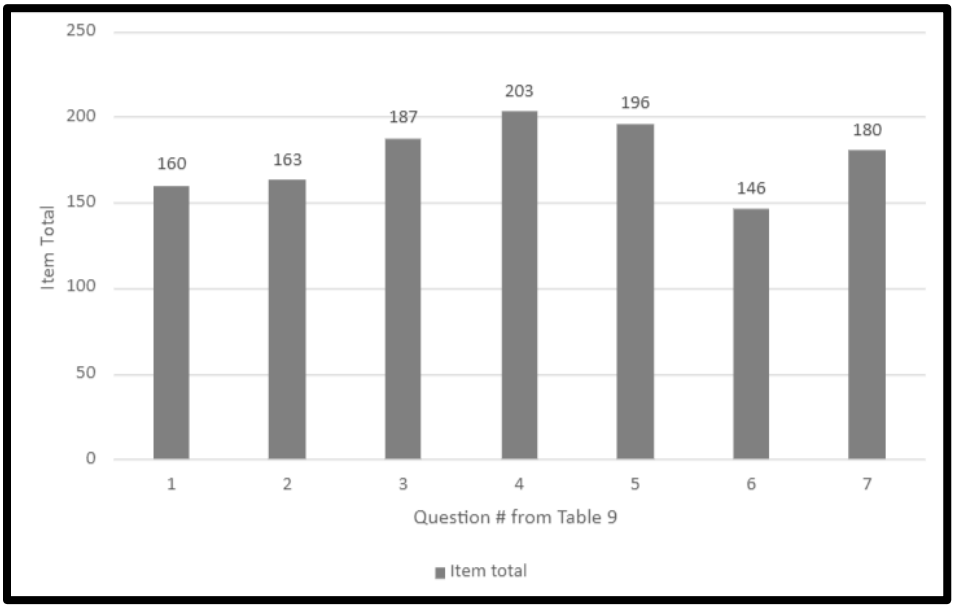
See Appendix B.

The highest response on the CE scale showed that 94.7% of participants at least somewhat disagreed with the statement: "Teachers here don't have the skills needed to produce meaningful student learning" (see Table 9, Question 4). Question 4 scored the highest among all teacher responses on the CE scale at 203. The second-highest scoring question on the CE scale was "teachers in this school truly believe that every child can learn," with 92.1% of participants at least somewhat agreeing with that statement and an item total of 196 (see Table 9, Question 5).

The lowest scoring questions on the CE scale revolved around motivating students to learn, dealing with discipline issues, and students coming to school ready to learn. When dealing with discipline issues, 76.3% of participants disagreed with the statement that "teachers in this school do not have the skills to deal with student discipline problems" (see Table 9, Question 7), with an item total of 176. Also, according to the survey results, 76.3% of participants agreed that teachers at their school "are confident they will be able to motivate their students" (see Table 9, Question 2), with an item total of 163. The CE scale also showed that 79.0% of participants agreed that "teachers in this school are able to get through to the most difficult students" (see Table 9, Question 1). The item total for that question was slightly lower than the previously mentioned questions, totaling 160. This discrepancy showed that although a more significant percentage of teachers said they agreed, more participants only somewhat agreed with the statement, with 42.1%, rather than at the agreed or strongly agreed categories on the Likert scale. The lowest scoring question on the CE scale stated, "these students come ready to learn," with only 65.8% of participants agreeing with the statement and an item total of 146 (see Table 9, question 6).

Figure 3

Item totals of Collective Efficacy (CE) Scale Questions



In addition to using questions from the CE scale, the researcher used an open-ended question focused on the virtual teaching experience during the COVID-19 pandemic.

Themes for Research Question 1

The researcher determined three themes from the data based on the CE scale questions and the open-ended question results. The first theme that emerged from the CE scale was that teachers in the study strongly believed that every student could learn even in a virtual instruction setting was supported by the responses to the CE scale questions and the definition of effective instruction provided by the participants. Participants believed the teachers in their respective school buildings could motivate their students in the virtual setting, connect with even the most challenging students, and believe that every student can learn. Overall, the results of the CE scale indicated a positive impact on student learning in the virtual setting.

The second theme focused on teachers' skills to "produce meaningful student learning." Although teaching in a virtual setting was out of the norm for most participants, it was clear from the results of the CE scale that they believed that they had an impact on the students and that the teachers in their school had the necessary skills to influence student achievement positively. According to the CE scale response, over 90% of the participants believed the teachers in their building had the skills necessary to teach content to their students in the virtual setting meaningfully. The results of the CE scale demonstrate a strong sense of collective efficacy among the study participants.

Finally, the third theme focused on the need for time to collaborate with peers to create online content and plan lessons, as evident from the participant responses to the open-educed question about virtual instruction. One participant stated, "it would have been nice to have some time built into the day for content creating." Another participant said that "teachers need to be given time to figure out how to incorporate something new." The participants' comments indicated a need for common collaboration time among the virtual teachers to be able to make the necessary changes to instruction for the virtual learning environment. The research district should consider this suggestion when planning the virtual learning schedule.

Research Question 2

Research Question 2 focused on school efficacy during the COVID-19 pandemic regarding virtual instruction. To determine school efficacy, participants responded to five questions from the School Effectiveness (SE) Index (Hoy, 2009) that most aligned with Research Question 2. The researcher used the same calculation method from the CE scale to determine the district's SE Index for each question based on a six-point scale, see

Table 10. This calculation method allowed the researcher to determine individual teacher perceptions and allowed for consistency between the research tools used in the study. The total points possible for each question on the SE Index was 228.

Table 10

School Effectiveness Index (SEI)

Question	% Strongly Disagree, Disagree or Somewhat Disagree	% Strongly Agree, Agree, or Somewhat Agree	Item total	# of Participants That Answered the Question
1. The teachers in my school do a good job of coping with emergencies and disruptions.	5.3%	94.7%	193	38
2. When changes are made in the school, teachers accept and adjust.	15.8%	84.2%	171	38
3. Teachers in this school are well informed about innovations that could affect them.	18.4%	81.6%	164	38
4. Teachers in this school anticipate problems and prevent them.	13.2%	86.8%	166	38
5. Teachers in this school use available resources efficiently.	5.3%	94.7%	172	38

Note. Questions from the SEI (Hoy 2009) were used with permission; See Appendix F.

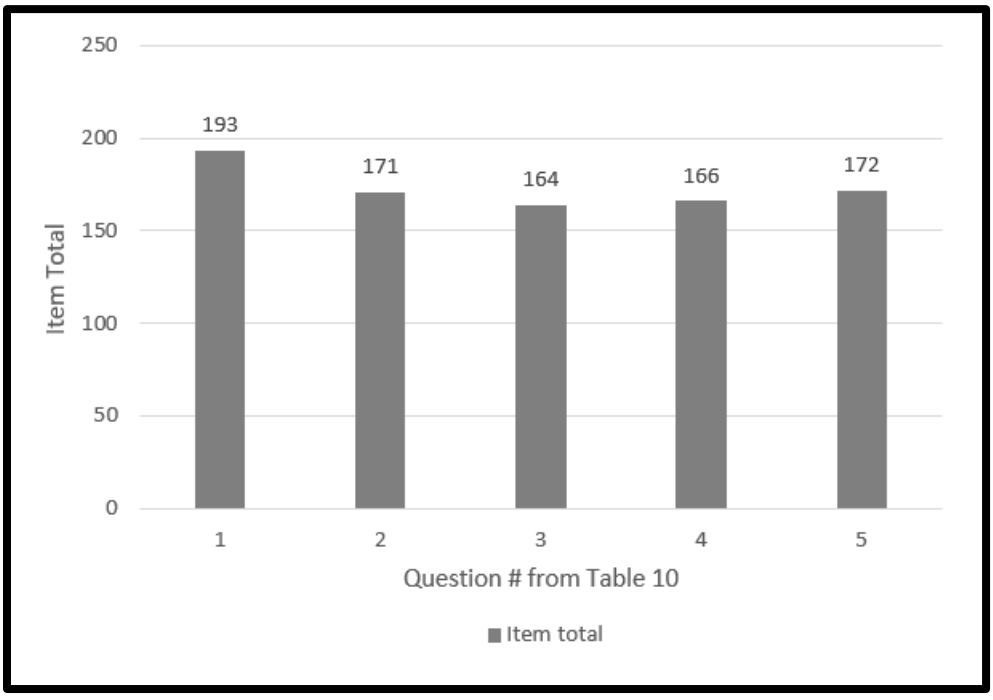
According to the survey results, the highest-scoring question determined that 94.7% at least somewhat agreed with the statement that "the teachers in my school do a good job of coping with emergencies and disruptions," with an item total of 193 (see Table 10, Question 1). The second-highest scoring item scored 172 on the SE Index, with

94.7% of the participants at least somewhat agreeing that "when changes are made in the school, teachers accept and adjust" (see Table 10, Question 2). The discrepancy between the item total and the percentage shows that more people somewhat agreed or agreed with the statement than strongly agreed, which calculated a lower item total than question 1, while 94.7% remained the same.

The lowest scoring item determined that 81.6% of participants at least somewhat agreed that "teachers in this school are well informed about innovations that could affect them" (see Table 10, Question 3). The researcher calculated the item total for this item to be 164, which shows that of those who somewhat agreed with the statement, fewer strongly agreed than agreed or somewhat agreed.

Figure 4

Item totals of School Effectiveness Index (SEI) Questions

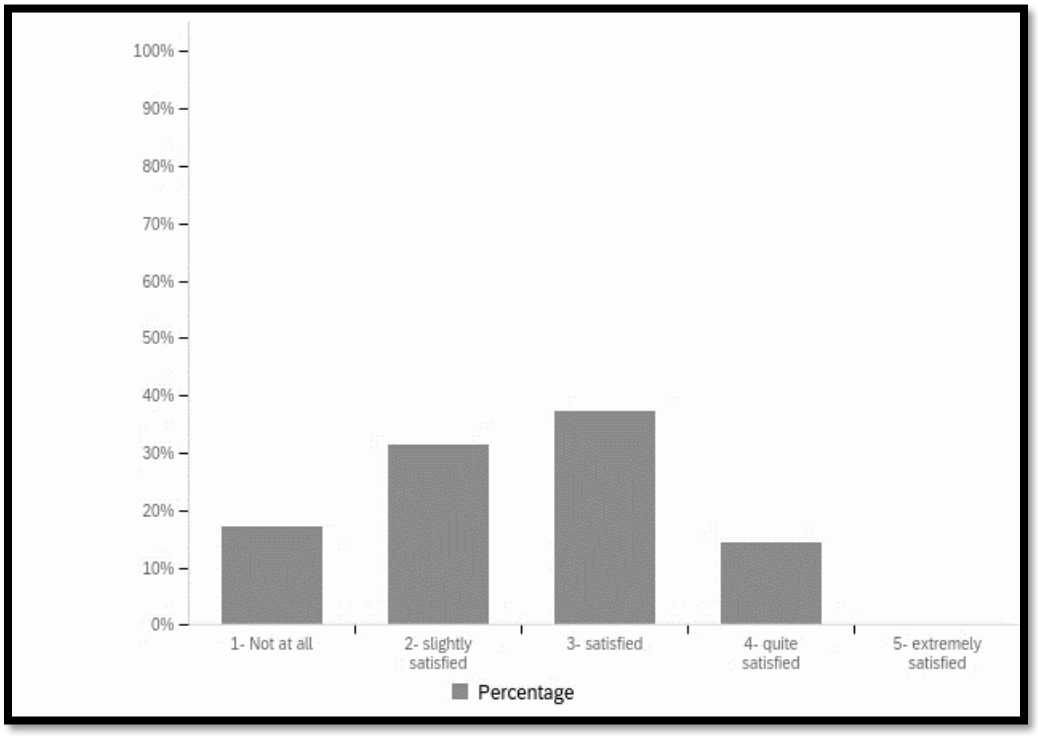


The survey asked participants, "How satisfied are you with the current teaching environment regarding virtual instruction?" The researcher also asked participants about

their perception of the virtual teaching model used at their school. According to the results, most of the participants, 82.9%, were at least slightly satisfied with the model of virtual instruction, with the mode score being 3, or "satisfied," as shown in Figure 5. However, none of the participants answered "extremely satisfied."

Figure 5

Satisfaction With Current Teaching Virtual Teaching Environment



The researcher also asked two open-ended questions from the Distance/Hybrid Learning Survey (Panorama Education, 2020) and one open-ended question the researcher created, which allowed the participants to express their perceptions of school effectiveness during the COVID-19 pandemic.

Themes for Research Question 2

After reviewing the data from all questions aligned to Research Question 2, two themes emerged from the data. The researcher concluded the first theme from the results

of the SEI. According to that data, the researcher determined that teachers effectively used the resources provided by the schools in virtual learning environments. The results of the open-ended question "what is working well with the current virtual learning model that you would like to see continued?" (Panorama Education, 2020, Number 9) supported this theme. One teacher commented that they "utilized Google Classroom much more effectively this year and will continue." Another teacher said, "using recorded lessons and pre-loaded assignments will be a benefit when teachers are out for a sick day or personal day," and "zooming with other classes until it is safe to meet in large groups is a great way to continue to build community." Another quote from a participant said, "I love the use of Google Classroom with my students, and if they are absent, they can continue to learn and complete assignments." These quotes support the theme of effective use of resources in the schools in the virtual learning environment.

A second theme that emerged from the data was the need to revise the current virtual model. As shown in Figure 1, none of the participants were "extremely satisfied" with the virtual instruction model at the schools in the research district. Nearly half of the participants (48.6%) were only slightly satisfied with the current model or not satisfied at all. When participants had the opportunity to express their feelings about the virtual model in the open-ended question "what is challenging about the current virtual learning model that you would like to see improved" (Panorama Education, 2020, Number 10), participants' responses supported the need for revising the current virtual model in the research district. One teacher said, "it is extremely difficult to help the virtual students while working with the in-person students at the same time." Another teacher stated a need to " hold virtual students accountable for attendance" and "require the

administration to contact home when students are not actively participating in class." Still, another participant wrote, "divide the in-person and virtual students whenever possible." Due to the survey responses, it is clear that the research district needs to change the current virtual model. After teaching virtually for over a year, the study participants would most likely have ideas for the administration on how to restructure the virtual model that benefits both teachers and students.

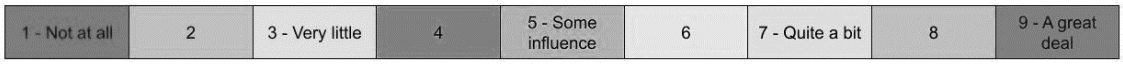
Research Question 3

The researcher also studied teachers' perceptions of SE in the virtual learning environment. The researcher selected 11 questions from the Teachers' Sense of Efficacy Scale (TSES) (Tschannen-Moran & Woolfolk Hoy, 2001a) most aligned with Research Question 3. The participant survey also included one question from the Distance/Hybrid Learning Survey for instructional staff (Panorama Education, 2020) that best aligned with Research Question 3. The question related to the social-emotional effect the current virtual learning model had on the participants. The researcher also created an open-ended question to allow participants to express their feelings about virtual instruction.

The authors of the TSES short form divided the questions into three subsections, efficacy in student engagement, instructional strategies, and classroom management (Tschannen-Moran & Woolfolk Hoy, 2001a). Scoring the TSES includes calculating the mean of each question and subsection on a Likert item nine-point scale, see Figure 6, instead of weighting the questions for calculations (Tschannen-Moran & Woolfolk Hoy, 2001a).

Figure 6

Rating Scale for Teachers Sense of Efficacy Scale (TSES)



The researcher did not use all of the questions on the TSES but calculated the mean scores for each question used and for the subsections aligned to the questions to analyze for themes, see Table 11. In comparison to the mean scores for the Likert item questions of the TSES, the researcher also computed the mode score for each question. The researcher used this non-parametric measure to check for inaccuracies while interpreting the data (Lindelov, 2018). While there tends to be some controversy regarding using non-parametric measures to analyze Likert item questions, it gives the researcher additional information to draw conclusions (Lindelov, 2018).

Table 11

Teachers Sense of Self Efficacy Scale (TSES)

Question/Subsection	Mean	Mode	# of Participants That Answered the Question
1. How much can you assist families in helping their children do well in school? – Student Engagement	6.5	5.0	35
2. How much can you do to motivate students who show low interest in school work? – Student Engagement	6.5	7.0	35
3. How much can you do to get students to believe they can do well in school work? – Student Engagement	7.0	7.0	34
4. How much can you do to help your students value learning? – Student Engagement	6.8	7.0	35
5. How much can you do to control disruptive behavior in the classroom? – Classroom Management	6.9	7.0	35
How much can you do to get children to follow classroom rules? – Classroom Management	7.0	7.0	35

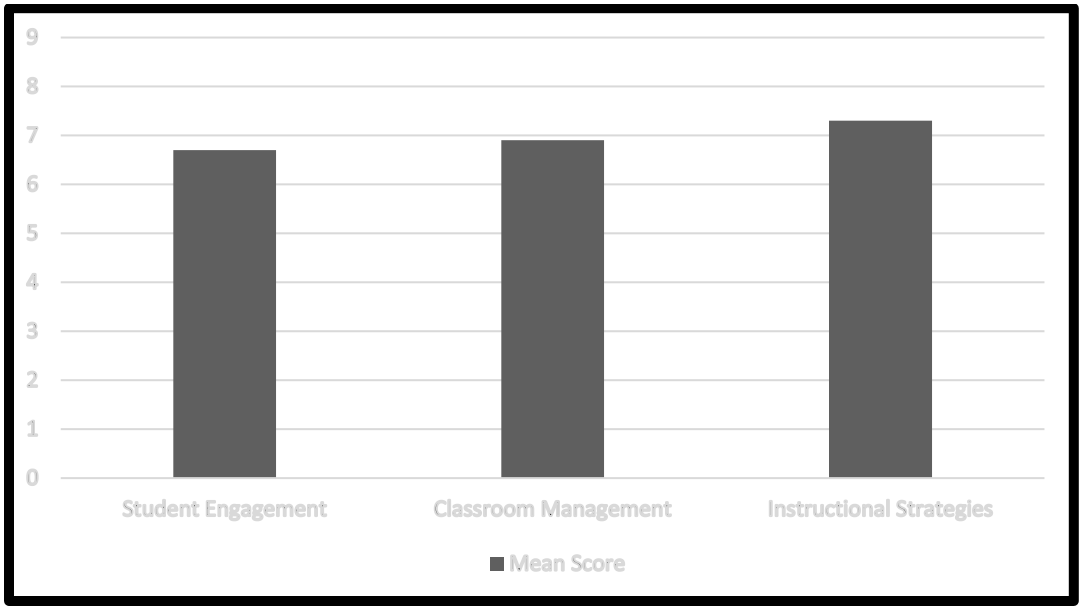
6. How much can you do to calm a student who is disruptive or noisy? – Classroom Management	6.6	7.0	35
7. How well can you establish a classroom management system with each group of students? – Classroom Management	7.2	8.00	35
8. How much can you use a variety of assessment strategies? – Instructional Strategies	7.0	7.0	34
9. To what extent can you provide an alternative explanation or example when students are confused? – Instructional Strategies	7.8	8.0	35
10. How well can you implement alternative strategies in your classroom? – Instructional Strategies	7.0	7.0, 8.0	35

Note. Questions from the TSES (Tschnannen-Moran & Woolfolk Hoy, 2001a) were used with permission; See Appendix D.

Based on the mean results of the TSES, the participants in the felt strongest that they could "provide an alternative explanation or example when students are confused." The survey question scored a mean of 7.8 out of a possible score of 9 and was within the range of "quite a bit." The mode score of 8.0 further demonstrated this as the highest scoring item. However, several other questions also received a mode score of 8.0 (see Table 11). The authors of the TSES categorized question number 10 in the instructional strategies subsection (Tschannen-Moran & Woolfolk Hoy, 2001a). The participants scored themselves the highest in the instructional strategies subsection on the TSES questions on the research study survey, with a mean score of 7.3 out of a possible 9 (See Figure 7). It was the only subsection that scored a mean of above a 7. The researcher concluded from the TSES questions that the participants felt the strongest self-efficacy in instructional strategies in the virtual environment.

Figure 7

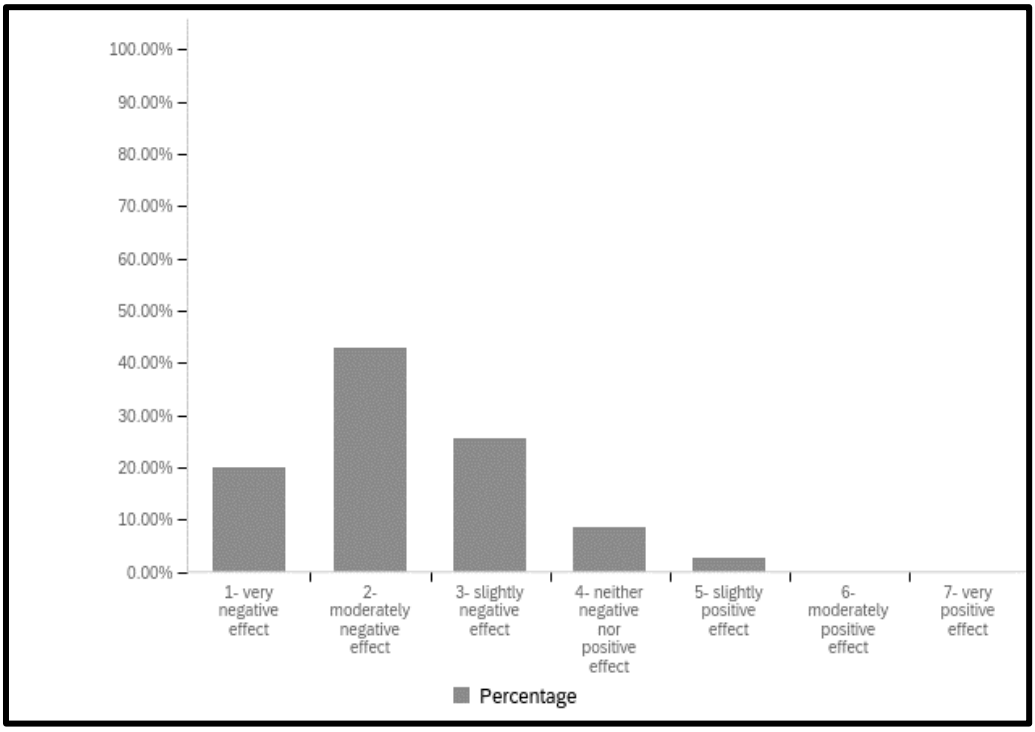
TSES Subsection Mean Scores



Another question on the researcher's survey aligned with Research Question 3 came from the Panorama open-source Distance/Hybrid Learning Survey for instructional staff. Figure 8 demonstrates the results of that question which asked participants, "what kind of effect is the current learning model having on your social-emotional well-being?" (Panorama Education, 2020, Number 7).

Figure 8

Effect of Current Learning Model on Social-Emotional Well-Being



While the participants scored themselves at a mean of 7.3 in the instructional strategies category on the TSES, 88.6% of the research study participants said that the current model of instruction is having at least a slightly negative effect on their social-emotional well-being with a mode score of 2, or "moderately negative effect." The researcher can conclude that while the participants felt emotionally drained from the virtual learning model, they still thought they could instruct students effectively.

Participants also responded to two open-ended questions from the Panorama Distance/Hybrid Learning Survey and one this researcher created to allow the teachers to express their feelings about effectiveness in the virtual setting. One question asked participants about what was "working well with the current virtual learning model that you would like to see continued," and the other question asked about what was

"challenging about the current virtual learning model that you would like to see improved" (Panorama Education, 2020, Numbers 9-10). The other open-ended question, created by this researcher, asked participants to share anything else they would like the researcher to understand about virtual instruction.

Themes for Research Question 3

After reading all the participants' responses to the open-ended questions, the researcher noticed a theme of allowing self-paced instruction for students. For example, one participant wrote, "I like the flexibility to adjust my lessons/schedule to meet the needs of my students." While another participant mentioned, "the one thing that works well for the students in our building is that they get to work at their own pace." These responses support the participants' answers on the TSES that showed a higher mean score for the instructional strategies subsection. Returning to the overarching participant definition of effective instruction, teachers discussed meeting the needs of every student in the classroom. Allowing students to work at their own pace and having the flexibility to adjust lessons to meet all students' needs is a positive outcome of virtual instruction based on the participants' definition of effective instruction.

Another theme the researcher determined from the open-ended questions was the struggle to keep students engaged in the virtual learning environment, which supported the lower mean score for the student engagement subsection on the TSES questions. While the CTE scale indicated that the study participants felt strongly about being able to motivate students in the virtual setting, the responses to the open-ended questions detailed the struggle to keep the students motivated throughout the learning day.

Through the comments from the study participants, it is evident that the current virtual learning environment is not practical for all students. One teacher wrote, "the hardest part was engaging virtual learners," and another wrote, "oftentimes the virtual students did not participate." Another study participant noted that "some students never interacted with the class, the teacher, or the assignment, and there wasn't much I could do about it." One participant also mentioned that it was difficult making connections with students, which may have led to lower student engagement. "The biggest challenge was to ensure a solid community and relationships with each student through a computer screen," one participant wrote. These comments indicate that a change in the model of virtual instruction should be a priority in the research district.

The researcher also determined that the virtual learning environment was stressful, as was evident from the survey question regarding the social-emotional effect of the current teaching model, see Figure 8. A total of 31 participants, or 88.5% of those who answered this survey question, felt that the current learning model was having at least a slightly negative effect on their social-emotional well-being, with the mode being a score of 2 or a moderately negative effect. Open-ended response questions support this theme. For example, a quote from one participant reads, "It can be so overwhelming. We have so much to manage." While another participant wrote, "Virtual teaching is lonely; it weighs on you socially and emotionally." Likewise, another participant noted [that during virtual instruction], "your focus lapses, you lose your train of thought, and it becomes overwhelming in terms of management; as a result, you start dropping things, and items start slipping through the cracks." The researcher can conclude that while the participants felt emotionally drained from the virtual learning model, they still thought they could

instruct students effectively, as evidenced by their responses to TSES. Due to the stress of virtual teaching, it is imperative to provide emotional support for the virtual instructors in the research district.

Research Question 4

The researcher aimed to study teachers' perceptions of self-efficacy regarding technology proficiency and professional development in the virtual learning environment. The researcher added Likert-scale questions from the Technological, Pedagogical, and Content Knowledge (TPACK) survey and the Distance Learning Survey to the data collection tool. In addition to those scale-type questions, the researcher also included open-ended questions from the Distance Learning Survey and created additional open-ended questions to allow the participants free writing opportunities on the subject. Finally, the researcher gathered and analyzed the participant data to determine themes for the research district's future planning of technology professional development.

The researcher calculated the questions from the TPACK survey on a five-point Likert-type scale ranging from strongly disagree to strongly agree and then used the parametric mean for each question. The researcher also used the non-parametric measure of mode for the TPACK questions for a deeper understanding of the data collected by the participants, as described in Table 12.

Table 12

Technological Pedagogical Content Knowledge (TPACK) Survey Questions

Question	Mean	Mode	# of Participants That Answered the Question
1. I know how to solve my own technological problems.	3.7	4.0	35
2. I can learn technology easily.	4.0	4.0	35
3. I keep up with important new technologies.	3.7	4.0	35
4. I frequently play around with the technology.	3.6	4.0	35
5. I know a lot of different technologies.	3.6	4.0	34
6. I have the technical skills I need to use technology.	4.1	4.0	35
7. I can choose technologies that enhance the teaching approaches for a lesson.	4.1	4.0	35
8. I can choose technologies that enhance students' learning for a lesson.	4.1	4.0	35
9. I can adapt the use of technologies that I am learning about to different teaching activities.	3.8	4.0	35
10. I can provide leadership in helping others to coordinate the use of content, technologies, and teaching approaches at my school and/or district.	3.4	4.0	35

Note. Questions from the TPACK Survey (Schmidt, Baran, Thompson, Koehler, et al., 2009) were used with permission; See Appendix E.

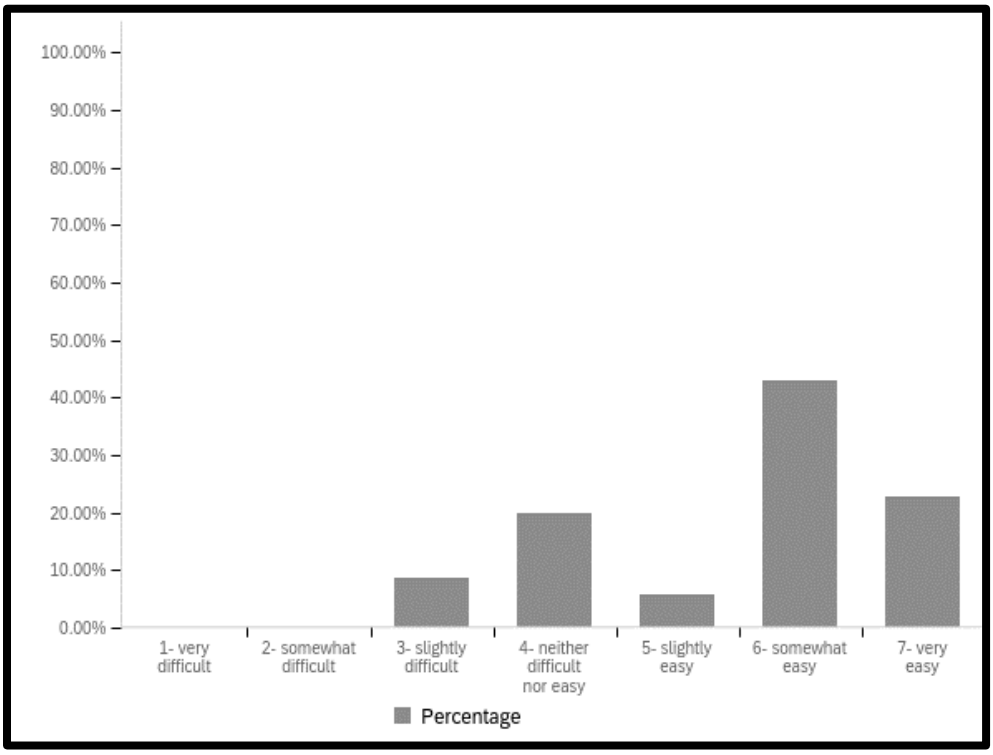
The results of the TPACK questions determined that the highest mean score, a 4.1 out of 5.0, showed that teachers "can choose technologies that enhance students' learning for a lesson" (Schmidt, Baran, Thompson, Koehler, et al., 2009, Question 34). Three other questions also scored above a mean score of 4.0. The lowest scoring question, calculated at a mean score of 3.37, stated, "I can provide leadership in helping others to

coordinate the use of content, technologies, and teaching approaches at my school and/or district" (Schmidt, Baran, Thompson, Koehler, et al., 2009, Question 41). The calculated non-parametric mode scores were the same for every question; therefore, they did not provide additional information for the researcher.

When asked, "how difficult or easy is it for you to use distance learning tools" (Panorama Education, 2020, Question 6), 25 participants, or 71.4%, responded that it was at least slightly easy to use the distance learning tools, with a mode score of 6, or "somewhat easy," as shown in Figure 9. The results led the researcher to conclude that the study participants could use the technology tools provided to them by the research district effectively in the virtual learning environment at the end of the 2020-2021 school year.

Figure 9

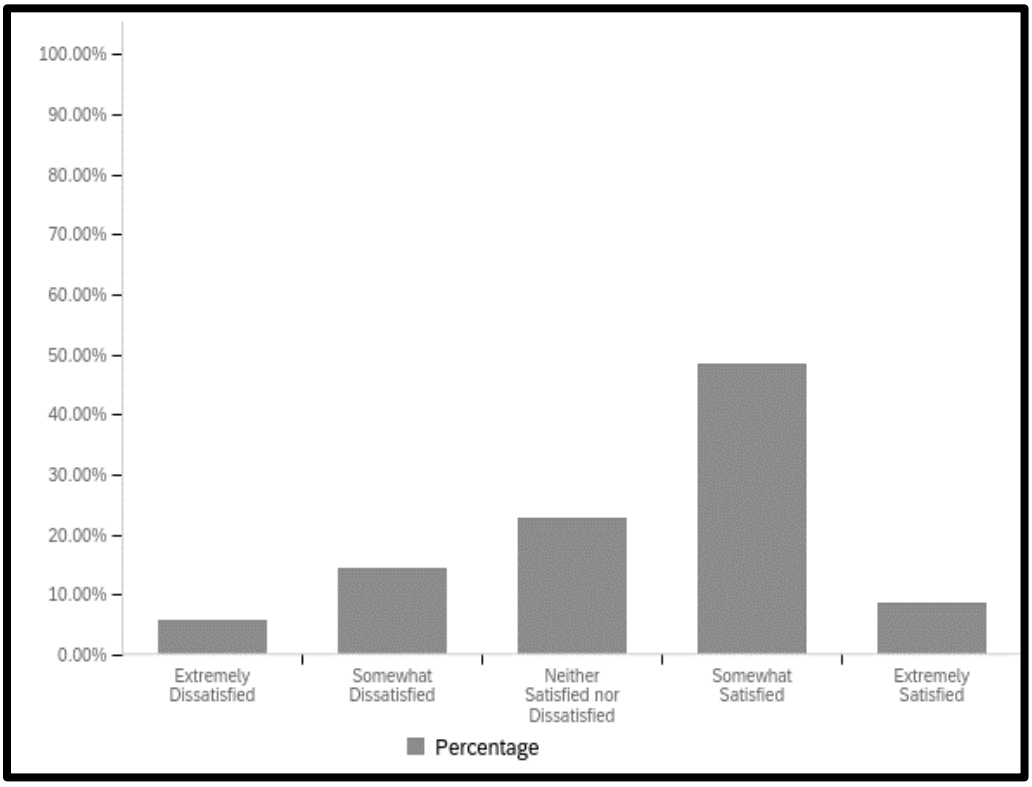
How Difficult or Easy Is It For You to Use Distance Learning Tools?



The researcher also asked participants to express their perceptions of professional development regarding virtual instruction provided by the research district, using a Likert item five-point scale. According to the survey question results, 20 participants out of the 35 who answered the question, or 57.1%, responded that they were at least somewhat satisfied, with a mode score of 4, or "somewhat satisfied," with the professional development provided to them by the research district related to technology tools and virtual instruction models, as shown in Figure 10.

Figure 10

Satisfaction of Professional Development



The responses to the Likert-scale and open-ended questions led the researcher to develop themes based on the data collected.

Themes for Research Question 4

The researcher concluded one theme from the data collected on Research Question 4. Participants gained a greater understanding of technology throughout the COVID-19 pandemic. As noted in Figure 9, 71.4% of the participants reported that the technology used during virtual instruction was either slightly easy, somewhat easy, or very easy. In contrast, only 8.6%, or three participants, reported using technology was slightly difficult, and zero participants reported it being somewhat or very difficult. One participant said, "I can now use several different Google Apps I didn't /couldn't before, and I have gotten quite good at using Kami to provide virtual students with meaningful comments." While another participant noted, "I feel I have learned how to utilize technology to check in with my students virtually through email and Zoom. I have definitely grown into being more comfortable with technology and its benefits." One participant even mentioned sharing their knowledge with other teachers and said, "I became more proficient, and I would share what I learned with my peers." One participant even noted future use of technology and said, "Zoom is a really useful tool that I hope we can continue to use, particularly for students who are homebound or sick or in ISS [In School Suspension]; I also really like the option to use it for snow days so that we do not have to add days at the end of the year." Through the experience of virtual teaching, the study participants grew in understanding how to use the digital tools necessary for virtual instruction. They will continue to use them even when they are no longer teaching in a virtual setting. Using the tools in a regular classroom is a positive effect of virtual instruction.

Summary

Chapter Four included the data analysis of the qualitative study regarding TE in the virtual learning environment. The researcher explained survey question results, open-coded the responses by color coding similarities in the data, and thematic coding based on similarities. Finally, the researcher described developed themes from the data collected. The study showed that virtual instruction is stressful. Teachers felt as if they needed more time to collaborate on virtual lessons. Teachers also noted that a lack of connection with students was a big concern of the virtual instruction model due to a lack of expectations for student participation. The research participants did indicate growth in their technology proficiency throughout the COVID-19 pandemic in the virtual learning environment. However, more than half of the participants felt that the professional development was satisfactory.

Chapter Five summarized the qualitative research study and draws conclusions based on the survey data for each research question. Additionally, the researcher discussed the implications of the research conducted. Finally, the researcher proposed recommendations for the research district and future studies on best practices in the virtual instruction environment.

Chapter Five: Discussion

In Chapter Four, the researcher reviewed data from the qualitative study on teachers' perceptions of teacher effectiveness (TE) in the virtual setting. The researcher discussed the data analysis of the qualitative study regarding teacher effectiveness in the virtual learning environment and coded the responses based on similarities. Based on the data coding analysis, the researcher developed themes for each of the four research questions in the study.

For virtual instruction to succeed, educators must have positive teacher efficacy. Teachers must feel capable of instructing students in a virtual setting while having students participate in the virtual setting. In Chapter Five, the researcher summarized the qualitative study conducted regarding TE in the virtual learning environment using the themes described in Chapter Four to draw conclusions based on the data. Using the data collected from the study, the researcher provided the research district with findings based on the data to guide future planning for virtual instruction models and professional development for instructors. The researcher also discussed implications based on the qualitative research study's conclusions and recommendations regarding the research questions for future studies and best practices regarding virtual instruction.

Introduction and Summary of Study

In response to the COVID-19 pandemic, schools shut down to in-person learning in March 2020. In the fall of 2020, schools reopened with either in-person, virtual learning, or a combination of both (DESE, 2021; National Center for Educational Statistics [NCES], 2022; Zalaznick, 2021). Due to the changes in the instructional delivery methods of schools, the researcher chose to study teachers' perceptions of

teacher effectiveness in virtual instruction. The researcher's motivation for the study was to help guide the research district in planning for professional development needs, technology tools, and overall needs of educators related to teacher effectiveness in the digital learning environment.

The researcher conducted a qualitative study in one PreK-12 public school district in the Midwest United States, consisting of approximately 5,500 students. To qualify for the study, teachers had to teach in a virtual setting for the entire 2020-2021 school year. The researcher sent out an email with the link to an online *Qualtrics* survey to all potential participants (virtual instructors) via the Lindenwood email server.
The survey questions aligned with the research questions listed below.

RQ 1: What are teachers' perceptions of Collective Teacher Efficacy (CTE) in the virtual environment?

RQ 2: What are teachers' perceptions of School Effectiveness (SE) in the virtual environment?

RQ 3: What are teachers' perceptions of Teachers' Self-Efficacy (TSE) on teaching practices in the virtual environment?

RQ 4: What are teachers' perceptions of TSE on technology proficiency and professional development in the virtual environment?

Of the potential participants, 49 virtual instructors in the district completed the informed consent, and 41of those participants began to take the survey. Although not all participants completed every survey question, the researcher analyzed the data collected for themes to guide the district in future planning. The researcher focused on teacher perceptions of effectiveness in the virtual learning environment, including CTE, SE, and

TSE, regarding teaching practices and technology proficiency. The researcher also focused on professional development provided by the district and the perceptions of teachers' needs in this area.

Authors noted in the current literature suggested that teacher efficacy was a high indicator of student achievement in the classroom. Researchers conducted numerous studies and discovered that CTE was the second highest indicator of student achievement (Corwin Visible Learning Plus, 2021). Due to the importance of teacher efficacy and the relatively new virtual instruction environment, the researcher used the literature review as the guiding focus for the research study regarding perceptions of teacher effectiveness in the virtual learning environment.

Summary of Findings and Conclusions

The researcher conducted a qualitative study on TE in the virtual classroom and focused on teacher efficacy due to the high effect size related to student achievement. From the data, the researcher discovered participants regarded effectiveness in the classroom as students mastering the skills in the curriculum and meeting the needs of all students in the class. The overarching definition of effectiveness guided the participants through the survey questions.

Research Question 1

Research Question 1 aimed to discover teachers' perceptions of CTE in the virtual learning environment. The survey included questions from the Collective Efficacy Scale (Goddard et al., 2000) and an open-ended question created by the researcher. The Collective Efficacy Scale was a collection of questions based on a six-point scale ranging from strongly disagree to strongly agree (Goddard et al., 2000). The survey results

indicated that the participants perceived that the teachers in their school had the skills needed to help students in the classroom and believed all students in their school could learn. The results indicated a strong sense of CTE in the research district regarding student learning. However, based on other results, the researcher determined teachers lacked the confidence to motivate students and believed that students did not come to school ready to learn in the virtual environment. Teachers perceived the need for increased collaboration time to create more meaningful experiences for students in the virtual setting—the need for creating meaningful learning experiences related to the literature review in Chapter Two. According to Fisher et al. (2021) and Meyer (2020), virtual learning environments should not mirror in-person learning, and teachers must carefully plan for virtual instruction using research-based strategies for learning.

Based on the data, the researcher determined that although the participants perceived the teachers believed every child could learn, planning became difficult for meaningful learning experiences due to time restraints in the daily schedule. Participants indicated they had limited time for collaboration to create online content; therefore, the virtual learning environment was not as conducive to learning as it could be.

Research Question 2

For Research Question 2, the researcher aimed to discover teachers' perceptions of SE in the virtual learning environment. Using survey questions from the School Effectiveness Index (Hoy, 2009), the Distance/Hybrid Learning Survey (Panorama Education, 2020), and a researcher-created question, the researcher collected participant data to discover the effect the school environment has in the virtual setting. The School Effectiveness Index (SEI) used a six-point scale ranging from strongly disagree to

strongly agree. The Distance/Hybrid Learning questions included one Likert scale and two open-ended questions. The five-point scale question asked participants to rank their satisfaction with their current learning model at their school from "not at all" to "extremely satisfied." The other questions from the Distance/Hybrid Learning Survey included open-ended response questions about their current virtual learning model.

After analyzing the data, the researcher concluded that teachers used the available resources efficiently and could cope with any emergencies or disruptions in the virtual learning environment. The data also revealed that the participants would like to continue using some of the resources provided even if they are no longer teaching virtually in the future. One of these resources included using Google Classroom to deliver content to students and for students to turn in assignments. Data indicates that teachers like the ability to put content on Google Classroom, even if they are going to be absent, for classroom continuity. This result is consistent with the review of literature indicating virtual instruction relies on a Learning Management System (LMS) to deliver content to students (Flavin & Bhandari, 2021).

According to the survey results, 48.57% of participants were either "slightly satisfied" or "not at all" satisfied, while 51.43% of participants were either "satisfied" or "quite satisfied." None of the participants chose the "extremely satisfied" option. However, participants indicated a split on their satisfaction with their virtual learning environment. This split suggests that the virtual learning environment in the research district needs to discuss the current virtual environment further and possibly modify it for future virtual instruction. Using the open-ended response data from the survey regarding what is currently working and what is challenging in the current virtual environment can

guide the research district as they plan for the future of virtual instruction in the district. Some participants indicated that virtual instruction should not be in concurrent classroom settings. The need to separate in-person and virtual students into separate learning environments was clear from the data. Participants also indicated a need to collaborate with other virtual instructors to create appropriate virtual learning lesson plans. The review of the literature supports this idea indicating that virtual learning environments should differ from in-person instruction models (Fisher et al., 2021; Meyer, 2020). Other participants shared that students need to be in-person for learning to be effective. The literature review in Chapter Two supports this theory and discusses that studies have shown that virtual instruction is less effective than in-person instruction (Hart et al., 2019; Loeb, 2020). The U.S. Department of Education also suggested keeping students in face-to-face learning environments as much as possible (U.S. Department of Education, 2021b).

Research Question 3

Research Question 3 aimed to discover teachers' perceptions of self-efficacy regarding teaching practices in the virtual learning environment. To determine results for this research question, the researcher used questions from the Teachers' Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001a) and the Distance/Hybrid Learning Survey (Panorama Education, 2020), and a researcher created open-ended question. The Teachers' Sense of Efficacy Scale (TSES) uses Likert-Scale questions on a nine-point scale ranging from "not at all" to "a great deal" (Tschannen-Moran & Woolfolk Hoy, 2001b). The questions from the Distance/Hybrid Learning Survey

included one Likert scale that used a seven-point scale ranging from "very negative effect" to "very positive effect" and two open-ended questions.

According to the data analyzed, the researcher concluded that teaching in a virtual learning environment had a negative impact on the participants, as 88.57% of the participants indicated that their current model of instruction was having at least a slightly negative effect on their social-emotional well-being. Through open-ended questions, participants suggested that teaching virtually is stressful and challenging to engage students at a distance. Participants indicated that student engagement was the most difficult part of the virtual learning environment. The survey revealed that participants perceive that planning for the virtual environment takes time and effort, unlike planning in-person lessons. Participants also mentioned that virtual teaching weighs one down both emotionally and socially and that virtual teaching can be extremely overwhelming. The data from the aligns with the researcher's literature review that stated teachers felt stress and exhaustion with virtual instruction, especially those teaching in a concurrent setting (Ali, 2020). The stress also could have been caused by the change that occurred from what they previously knew. As stated in the literature review, people go through the stages of change at different times, so while some may have felt more stress, others may have proceeded to a different stage of change and had different coping skills (Norcross et al., 2011). The degree of school communication regarding expectations from the district and school leaders may have been an additional factor in the participants' stress levels. The literature review in Chapter Two supports this idea indicating participants had a more positive relationship with change when communication was evident between the organizational leaders and the employees (Li et al., 2021).

However, participants indicated that they had "quite a bit" of influence in providing alternative explanations for students who did not understand the lesson. So, while the participants felt stressed in the learning environment, they continued to do what they knew was best for students regarding teaching practices. In fact, they indicated that they liked the flexibility of the virtual teaching model for self-paced instruction. As stated in the researcher's literature review, an advantage to the virtual learning environment is the opportunity for students to acquire self-discipline skills while learning in a self-paced virtual environment (Etherington, 2017).

Research Question 4

Research Question 4 aimed to discover teachers' perceptions of self-efficacy in technology proficiency and how they viewed their professional development needs regarding virtual instruction. The *Qualtrics* survey included questions from Distance/Hybrid Learning Survey (Panorama Education, 2020), and the Technological, Pedagogical, and Content Knowledge (TPACK) Survey (Schmidt, Baran, Thompson, Mishra, et al., 2009), and four questions created by the researcher. The question from Distance/Hybrid Learning Survey questions allowed the teachers to express their perceptions of technology use in the virtual classroom through a Likert-scale question that asked about the difficulty of using digital tools, scored on a seven-point scale ranging from "very difficult" to "very easy." The TPACK questions included ten Likert-scale questions regarding technology proficiency ranked on a five-point scale from "strongly disagree" to "strongly agree." While the four researcher created questions included open-ended questions regarding technology growth, helpful technology tools, and professional

development, along with a question that allowed the participants to say anything they chose to say about virtual learning.

The researcher distributed the survey to participants near the end of the 2020-2021 school year, which may have affected the responses regarding technology proficiency. However, the data showed that 71.41% of the participants ranked the use of digital tools in the virtual learning environment as at least "slightly easy," with 42.86% describing it as "somewhat easy" and 22.86% ranking it as "very easy." This data leads the researcher to conclude that using digital tools was not a significant contributing factor to the stress teachers described in Research Question 4. Prior research on digital tools indicated that while teachers may feel proficient in using digital tools, they may not possess the skills to use them innovatively to increase student achievement and engagement in classroom activities (Kent & Giles, 2017). Reviewing the previous research might indicate that student engagement may have been higher if the teachers had used the digital tools more innovatively.

When asked about the professional development they received regarding technology and teaching in a virtual environment, 57.14 % of participants were either "somewhat satisfied" or "extremely satisfied" with the professional development they received. However, this does not indicate a large percentage of satisfaction. The lack of satisfaction indicates to the researcher that a more robust professional development program must be in place before starting a virtual instruction model at the research district, including follow-up training sessions throughout the school year to ensure continuity.

The data collected and analyzed by the researcher during this qualitative study has implications for future virtual instruction settings. Virtual instruction is most likely to stay in a variety of instructional models. As mentioned in the literature review in Chapter Two, five states had already required high school students to take at least one online course before graduation before the pandemic (Etherington, 2017).

Theoretical Implications

While this qualitative research study only focused on one PreK-12 school district, it still has implications for other virtual learning environments. The researcher based the study on teacher effectiveness, specifically teacher efficacy in the virtual learning environment. Before conducting this qualitative study, the researcher had no preconceived ideas regarding teacher efficacy in the virtual learning environment.

The data analysis revealed that CTE was relatively high, as teachers believed every child could learn in the virtual environment and that they possess the skills necessary to help students in their learning. However, the data also revealed that the participants did not believe the students in the virtual setting came to school ready to learn; this was also evident in open-ended response questions. Due to the belief that students are not prepared to learn, schools may need to reevaluate the expectations of students in the virtual learning environment to ensure students are ready to learn and come to the virtual class prepared for the day. Since the questions from the CTE Scale were not specific to one school, it is difficult for the researcher to determine which schools in the district ranked higher in CTE than others. However, the research district can look at the CTE as an overall district score and determine the next steps for increasing CTE for all teachers in the district.

According to the literature review in Chapter Two, strong leaders influence school effectiveness (Marzano, 2012; Marzano et al., 2005). The study did not reveal qualities of strong leadership in the survey responses. The data from the School Effectiveness Index (SEI) questions revealed that teachers perceived the teachers in their school ranked high in dealing with disruptions or emergencies in the classroom and using resources effectively. However, the questions from the SEI did not ask about school leadership. The researcher did receive responses regarding leadership in open-ended questions. Those responses revealed that the administration needed to contact parents if students were not participating in the virtual learning environment. However, those statements did not specifically relate to the leadership qualities of the administrators. Since the researcher did not receive enough responses regarding leadership, the theory of strong leadership leading to school effectiveness cannot be determined. Another study focused on the leadership qualities of administrators during virtual instruction could provide more data on this topic.

The researcher also focused the research study on Teachers' Sense of Efficacy (TSE) in the areas of best practices, technology, and professional development needs. The survey responses indicated that teachers perceived high efficacy in the areas of best practices and technology proficiency; however, the participants also responded that they felt lonely, and teaching in a virtual environment weighed heavily on their social-emotional state. The researcher can theorize that the social-emotion strain of virtual teaching could be attributed to the stages of change. Also, the researcher can theorize that teaching in a virtual setting during the COVID-19 pandemic and the uncertainty of how the virus would impact the educational environment contributed to the social-emotional

stress levels of the participants. The researcher suggests further research, specifically designed to determine the causes of emotional stress, as a next step in learning more about the correlation between virtual instruction and social-emotional stress.

Practical and Future Implications

Through this qualitative study, the researcher discovered that most participants perceived they possessed average to above average technology proficiency and could use the technology tools required for virtual teaching. Participants mentioned that using Google Classroom, Google Workspace for Education applications, Zoom, and Kami were the most helpful digital tools in the virtual environment. Implications for future instructional practice based on the results of this survey include using technology tools not only for virtual instruction but for in-person instruction, too. The responses from the participants in this research indicated that they would continue to use digital tools even when they are no longer teaching in a virtual setting. The survey responses imply that the technology they used in the virtual environment can transfer to the traditional in-person classroom. As the research district moves forward with virtual instruction, the researcher suggests that the research district continue to allow the virtual teachers to use digital tools and possibly provide professional development on how to use those tools even more efficiently for virtual teaching. Additionally, all teachers would benefit from professional development on technology tools, as teachers indicated that they would continue to use them even in an entirely in-person learning environment.

In addition to using technology in the classroom, based on the data from the study, the researcher suggests that teachers are provided with sufficient time to collaborate to give instructors time to discuss best practices for virtual instruction.

Professional development on best practices for virtual instruction should also be provided so that teachers are using the best strategies for student success in the virtual setting. Professional development and collaboration time should be built into the daily schedule allowing teachers time to work with each other to increase their understanding of how to best teach in a virtual learning environment. A future implication may include the need to hire more teachers to create a schedule that allows for collaboration and professional development time.

Due to the numerous responses in the data regarding the stress the virtual instructors felt, another practical implication is to provide mental health services for the virtual teachers. Some of the pressure seemed to stem from a feeling that lacked support by administrators when it came to holding students accountable for attending the virtual Zoom sessions. This lack of support from administrators implies that teachers need more help from the building administrators to ensure that students attend virtual class sessions and participate in all virtual assignments. For future implications, the research district should investigate the need for mental health providers and more administrative support to teachers in the virtual instruction setting and the in-person instructors as students return to in-person instruction.

Strengths and Weaknesses of the Study

The researcher conducted this qualitative study in one PreK-12 district in a suburban town in the United States Midwest region with virtual instructors of grades Kindergarten through 12th grade. The district offered two different virtual environments, concurrent and full virtual. The researcher used a variety of research-based questions from previously created survey tools during the. Since the researcher used research-based

questions, they felt confident that the survey questions provided accurate data results from the participants. The researcher also carefully aligned the survey questions they used to the research questions in the study. The survey included some questions that overlapped the research questions. For those overlapping questions, the researcher analyzed the results multiple times depending on the research questions aligned to those survey questions.

Some limitations of this qualitative study included the limited research study setting. Since the researcher administered the survey in only one school district, it may be limited to transferring the results to other educational settings. In addition to the study setting, the study included only 41 participants who answered the survey questions. While this was a good response for the study district, it limits its scope of educator responses overall. Therefore, limiting its transferability to other settings. In addition to limiting transferability, due to the study being conducted during a global pandemic, which was an unprecedented event, it would be difficult to replicate the study under the same conditions.

Other limitations refer back to the results of the study. While the researcher determined themes for all research questions, data regarding social-emotional needs and support from the administrators will need further research. The lack of quality data on these two topics was a limitation of the survey created by the researcher.

Recommendations for the Research District

Due to the limited number of participants in the study, the researcher proposed that the researched district conduct follow-up surveys, interviews, or focus groups to gather additional data on TE in virtual learning environments. For example, one

suggestion included implementing a follow-up survey or focus group of students who continually participated in virtual learning environments to ensure the current model met the needs of all students. Furthermore, she suggested that the decision makers discuss virtual learning with parents, since parents are the ones selecting virtual instruction.

One recommendation for an easier transition to virtual instruction included building virtual instruction days into the school calendar (Marshall et al., 2020). These days are in addition to the optional use of Alternative Methods of Instruction (AMI) days allowed by the state of Missouri. Using the AMI days strategically throughout the school year, instead of only for snow days, could provide an easier transition from in-person to virtual instruction. The researcher suggested that the virtual learning days would give students more experience working from home and allow teachers to plan for those days through collaboration with their colleagues, which is crucial in case the need ever arises again to change to remote instruction entirely

As noted from the survey data, teachers needed increased time to collaborate with colleagues for virtual instruction. To alleviate the lack of collaboration time, the researcher recommended that each school building incorporate collaboration time into the schedule for all virtual instructors. The additional collaboration time may require the district to hire additional educators to create a schedule conducive to collaboration amongst teachers. However, the researcher believed collaboration time is key to ensuring TSE for virtual instructors.

The data also determined that the virtual instructors did not feel that the administrators held virtual students accountable for their attendance in virtual settings. The researcher suggested that teachers and administrators collaborate to create

expectations for virtual students. Additionally, the researcher posited that administrators must clearly communicate expectations to both students and parents. If the expectations are not met, students would then return to in-person instruction methods.

The researcher's final recommendation denoted that professional development is necessary for best practices to occur in virtual classrooms. The researcher suggested providing professional development on virtual instruction methods and technology to virtual teachers regularly and that leaders create a professional development schedule that they adhere to throughout the school year.

Recommendations for Further Research

The researcher conducted the study with virtual instructors in one public PreK-12 school district in the Midwest region of the United States. The study consisted of 41 participants. To broaden the research regarding teacher effectiveness in the virtual classroom, the researcher proposes that other researchers conduct more extensive scale studies with school districts nationwide. These broader studies ensure that more teachers' voices are heard regarding teacher effectiveness, specifically teacher efficacy, in the virtual setting.

Focusing on many elements of teacher efficacy had its limitations. The researcher collected a lot of data, but it may have been too surface level. For a more robust data set, the researcher suggests separating the research questions from the into separate studies for each research question. Researchers should develop shorter surveys or conduct focus groups aimed at one specific research question from the study. As previously mentioned, while 41 participants began the survey, some questions only had 35 participant responses. The lower response rate indicates that the survey may have been too long or

cumbersome. Shorter surveys focused on each research question allow the researcher to structure the questions differently and focus on one element of the research study at a time.

Another recommendation for further research is to separate the studies from full virtual and concurrent settings, as the environments are very different. Researchers could further separate virtual settings from synchronous and asynchronous, as these two types are entirely different. Researching a specific model of virtual instruction would provide the researcher with a more focused data set to analyze.

Finally, the researcher proposes that future researchers focus on teachers' social-emotional states in virtual settings instead of in-person settings. While the change to virtual instruction was a change for many teachers, it may not have contributed to social-emotional issues. Teachers in traditional settings may also be experiencing social-emotional trauma due to the pandemic or other problems. Additional research needs to be conducted to address teacher efficacy issues regarding the social-emotional aspect of teaching.

Conclusion

Based on the data analyzed from the qualitative research study, the researcher concluded virtual instruction took a toll on educators. Participants mentioned that virtual teaching was "lonely," "overwhelming," "exhausting," and "it weighs on you socially and emotionally." Through the data, the researcher concluded teaching virtually had a perceived negative effect on the social-emotional health of virtual instructors. While more research needs to be done, based on the study's results, the researcher believed virtual teachers needed time to collaborate and participate in professional development

regarding best practices and technology in virtual learning environments. The collaboration time and professional development may help alleviate the stressors placed on the instructors' social-emotional well-being. Administrators' supporting of student expectations in the virtual learning environment could also empower instructors. Knowing the administrators will contact students and families to reinforce the expectations, virtual teachers could have some of the stressors of teaching lifted. Additionally, the researched district could provide professional emotional support for the virtual instructors to help them with the stress of the virtual learning environment.

The researcher also concluded that the digital tools used during virtual instruction should continue in traditional classroom settings when the participants returned to a face-to-face instruction model. Using digital tools for instruction could lead to greater student engagement and create opportunities for critical thinking and collaboration among classmates (American University School of Education, 2020; Sheninger, 2016). Allowing virtual teachers to create lessons using digital tools designed for the virtual learning environment could increase teacher efficacy and provide students with a virtual experience based on best practices.

Although the COVID-19 pandemic decreased in severity and required fewer virtual instructors in the researched district, virtual instruction is a teaching method embedded in the K-12 and higher education context. The researcher concluded virtual instructors needed to feel effective in virtual environments so student learning could occur. Through continued research on virtual learning environments and teacher needs for TSE, virtual learning environments can become a viable learning option for many students.

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Appendix A

Data Collection Tool – Survey Created in *Qualtrics*

LINDENWOOD

What is your teaching environment?

All Virtual (all students are at home and are joining class virtually)

All Access/Concurrent (some students are in-person, while some students are joining class virtually)

Other

Grade Level and Content Areas you are teaching during the 20-21 school year. (examples - HS Government and Sociology, 5th grade math/science, 1st grade all core subjects, Middle School P.E., etc.)

Age

Years of teaching experience

- 1-3
- 4-6
- 7-10
- 11-15
- 16-20
- over 20 years teaching experience

Please describe your previous experience in online teaching/learning that you have as either a teacher or a student (before the COVID-19 pandemic).

Describe your definition of effective instruction.

Collective Teacher Efficacy and School Effectiveness

Collective Teacher Efficacy Scale (Goddard, R. D., Hoy, W. K., & Woolfolk Hoy, A., 2000) questions are used with permission.

School Effectiveness Scale (Hoy, W. K., 2009) questions are open-source.

Regarding the current virtual learning environment at your school, please respond to each item and indicate the degree to which you agree with the following statements about your school.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
The teachers in my school do a good job coping with emergencies and disruptions.	○	○	○	○	○	○
When changes are made in the school, teachers accept and adjust quickly.	○	○	○	○	○	○
Teachers in this school are well informed about innovations that could affect them.	○	○	○	○	○	○
Teachers in this school anticipate problems and prevent them.	○	○	○	○	○	○
Teachers in this school use available resources efficiently	○	○	○	○	○	○
Teachers in this school are able to get through to the most difficult students.	○	○	○	○	○	○

Teachers in this school anticipate problems and prevent them.	○	○	○	○	○	○
Teachers in this school use available resources efficiently	○	○	○	○	○	○
Teachers in this school are able to get through to the most difficult students.	○	○	○	○	○	○
Teachers here are confident they will be able to motivate their students.	○	○	○	○	○	○
If a child doesn't want to learn, teachers here give up.	○	○	○	○	○	○
Teachers here don't have the skills needed to produce meaningful student learning.	○	○	○	○	○	○
Teachers in this school truly believe that every child can learn.	○	○	○	○	○	○
These students come to school ready to learn.	○	○	○	○	○	○
Teachers in this school do not have the skills to deal with student disciplinary problems.	○	○	○	○	○	○

Teacher Self Efficacy Scale

The following questions from the Teacher Self Efficacy Scale (Tschannen-Moran, M., & Woolfolk Hoy, A., 2001) are used with permission.

On a scale of 1-9, based on your current virtual instruction environment...

	1- Nothing	2	3- Very Little	4	5- Some Influence	6	7- Quite a Bit	8	9- A Great Deal
How much can you do to control disruptive behavior in the classroom?	○	○	○	○	○	○	○	○	○
How much can you do to motivate students who show low interest in school work?	○	○	○	○	○	○	○	○	○
How much can you do to get students to believe they can do well in school work?	○	○	○	○	○	○	○	○	○
How much can you do to help your students value learning?	○	○	○	○	○	○	○	○	○
How much can you do to get children to follow classroom rules?	○	○	○	○	○	○	○	○	○
How much can you do to calm a student who is disruptive or noisy?	○	○	○	○	○	○	○	○	○
How well can you establish a classroom management system with each group of students?	○	○	○	○	○	○	○	○	○

How much can you use a variety of assessment strategies?	○	○	○	○	○	○	○	○	○
To what extent can you provide an alternative explanation or example when students are confused?	○	○	○	○	○	○	○	○	○
How much can you assist families in helping their children do well in school?	○	○	○	○	○	○	○	○	○
How well can you implement alternative strategies in your classroom?	○	○	○	○	○	○	○	○	○

Distance Learning Survey

The following questions from the Distance Learning Survey (Panorama Education, n.d.), which is an open-source resource.

Learning Model

	1- Not at all	2- slightly satisfied	3- satisfied	4- quite satisfied	5- extremely satisfied
How satisfied are you with the current learning model at your school regarding virtual instruction?	○	○	○	○	○

Social-Emotional

	1- very negative effect	2- moderately negative effect	3- slightly negative effect	4- neither negative nor positive effect	5- slightly positive effect	6- moderately positive effect	7- very positive effect
What kind of effect is the current learning model having on your social-emotional well-being?	○	○	○	○	○	○	○

What is working well with the current virtual learning model that you would like to see continued?

What is challenging about the current virtual learning model that you would like to see improved?

Distance Learning Tools

	1- very difficult	2- somewhat difficult	3- slightly difficult	4- neither difficult nor easy	5- slightly easy	6- somewhat easy	7- very easy
How difficult or easy is it for you to use the distance learning tools (video calls, learning applications, etc.)?	○	○	○	○	○	○	○

Technological Pedagogical Content Knowledge (TPACK) Survey

The following questions are from the Technology Knowledge and the Technological Pedagogical Knowledge sections of the TPACK survey (Schmidt, et al., 2009). These questions are used with permission.

Please rank yourself on the following Technology Knowledge(TK) items below in regards to distance learning.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I know how to solve my own technical problems.	○	○	○	○	○
I can learn technology easily.	○	○	○	○	○
I keep up with important new technologies.	○	○	○	○	○
I frequently play around the technology.	○	○	○	○	○
I know about a lot of different technologies.	○	○	○	○	○
I have the technical skills I need to use technology.	○	○	○	○	○
I can choose technologies that enhance the teaching approaches for a lesson.	○	○	○	○	○
I can choose technologies that enhance students' learning for a lesson.	○	○	○	○	○
I can adapt the use of technologies that I am learning about to different teaching activities.	○	○	○	○	○
I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district.	○	○	○	○	○

How do you feel you have grown in your technology proficiency throughout the COVID-19 pandemic?

Which technology tools have been most helpful to you in the distance learning environment?

Professional Development

	Extremely Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Extremely Satisfied
How satisfied do you feel about the professional development you were provided on technology tools and virtual teaching (asynchronous, synchronous, student engagement, etc.)?	○	○	○	○	○

Please provide anything else you feel is necessary for the researcher to understand regarding virtual teaching during the COVID-19 pandemic.

Appendix B

Permission to use Collective Efficacy Scale

Gmail Tina Lauer <tnalau87@gmail.com>

Re: CE scale short form for dissertation use
1 message

Goddard, Roger D. <goddard.9@osu.edu> Thu, Apr 22, 2021 at 2:46 PM
To: Tina Lauer <tnalau87@gmail.com>

Dear Tina:

You may use the CE scale for your dissertation provided you include proper attribution (the academic journals require this). It is not available or profit or revenue generation use for non-profits.

Good luck with your study.

Roger Goddard

From: Tina Lauer <tnalau87@gmail.com>
Date: Thursday, April 22, 2021 at 12:33 PM
To: "Goddard, Roger D." <goddard.9@osu.edu>
Subject: CE scale short form for dissertation use

Good morning Dr. Goddard,

I am a doctoral student at Lindenwood University in St. Charles, MO. My dissertation chair and I found your Collective Efficacy Scale very useful for my study on teacher efficacy (both collective and individual) regarding teaching in a virtual environment during the pandemic. I would like to request permission to use the questions in your CE Scale in my survey to virtual teachers. I am wanting to study teacher perceptions about their abilities in teaching in a virtual setting to learn from their experiences and to guide future planning for virtual instruction.

Thank you,

Tina Lauer

Appendix C

Permission to use Panorama Distance Learning Survey

Gmail

Tina Lauer <tnalau87@gmail.com>

Re: Use of the Panorama distance learning survey
1 message

Tina-Marie Lohela <tlohela@panoramaed.com> Wed, Mar 31, 2021 at 8:45 AM
To: Tina Lauer <tnalau87@gmail.com>

Hi Tina,

Since our surveys are open source, people are free to use them as they see fit, including adapting the surveys for their own research. However, we recommend following the best practices outlined in our Survey Design Checklist, of course.

Good luck!
Tina-Marie

--
Tina-Marie Lohela
Outreach
@ Panorama Education

Schedule a meeting with me!

O: 617-631-9743
W: panoramaed.com

Introducing "Celebrating Resilience: A Summer Series"
Connect directly with fellow school and district leaders and educators for daily workshops, panels, and timely resources as we seek to plan for fall and build resilience in our students and community.

On Tue, Mar 30, 2021 at 9:10 PM Tina Lauer <tnalau87@gmail.com> wrote:

> Hello,
>
> I am a graduate student at Lindenwood University and am preparing to begin my dissertation research. I was told about your Distance Learning Survey online by my dissertation chair. I did not see any limitations of use in the .pdf file online, but I wanted to verify that the survey questions can be used during my research. I am wanting to use some of the questions from the teacher survey in my research of teacher perceptions during the pandemic.
>
> I look forward to hearing your response to my request.
>
> Thank you,
>
> *Tina Lauer*

Appendix D

Permission to use Teachers Sense of Self-Efficacy Scale

THE OHIO STATE UNIVERSITY COLLEGE OF EDUCATION AND HUMAN ECOLOGY

ANITA WOOLFOLK HOY, PH.D.

PROFESSOR
PSYCHOLOGICAL STUDIES IN EDUCATION

Dear Tina Lauer,

You have my permission to use the *Teachers' Sense of Efficacy Scale* in your research. A copy the scoring instructions can be found at:

http://u.osu.edu/hoy.17/research/instruments/

Best wishes in your work,

Anita Woolfolk Hoy

Anita Woolfolk Hoy, Ph.D.
Professor Emeritus

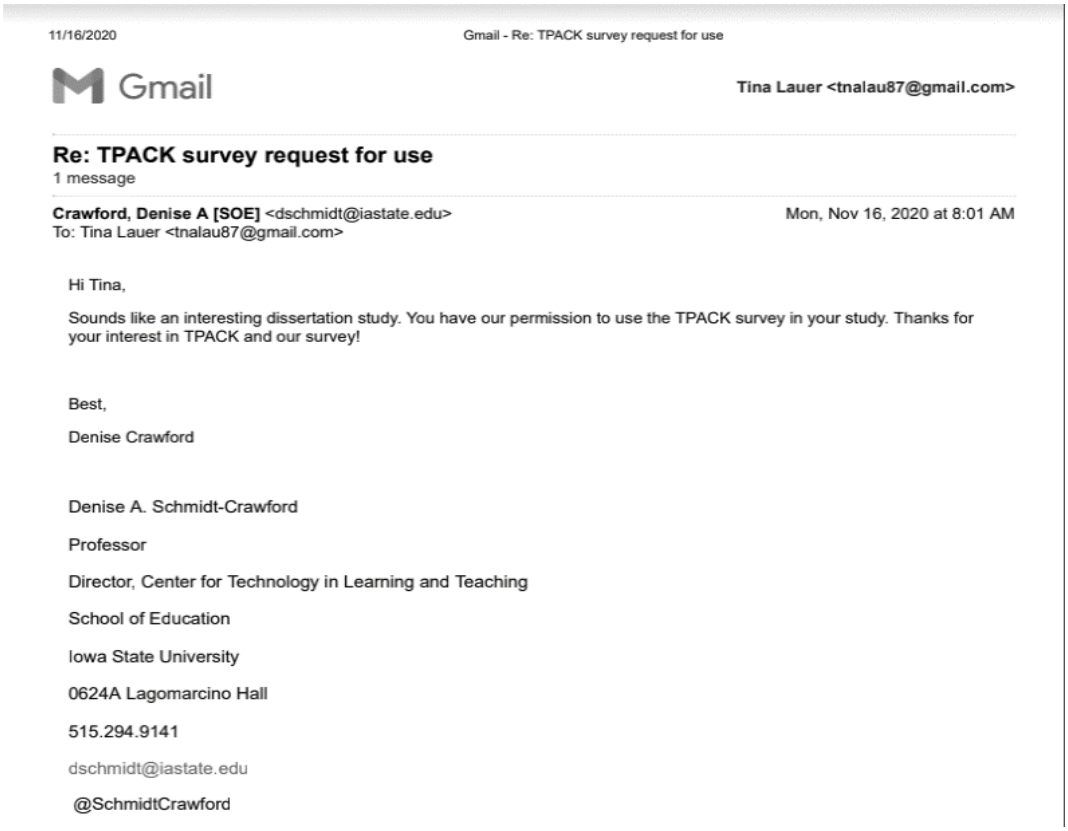
COLLEGE OF EDUCATION
29 WEST WOODRUFF AVENUE
COLUMBUS, OHIO 43210-1177

WWW.COE.OHIO-STATE.EDU/AHOY

PHONE 614-292-3774
FAX 614-292-7900
HOY.17@OSU.EDU

Appendix E

Permission to use TPACK Survey



11/16/2020 Gmail - Re: TPACK survey request for use

Gmail

Tina Lauer <tnalau87@gmail.com>

Re: TPACK survey request for use

1 message

Crawford, Denise A [SOE] <dschmidt@iastate.edu> Mon, Nov 16, 2020 at 8:01 AM
To: Tina Lauer <tnalau87@gmail.com>

Hi Tina,

Sounds like an interesting dissertation study. You have our permission to use the TPACK survey in your study. Thanks for your interest in TPACK and our survey!

Best,

Denise Crawford

Denise A. Schmidt-Crawford

Professor

Director, Center for Technology in Learning and Teaching

School of Education

Iowa State University

0624A Lagomarcino Hall

515.294.9141

dschmidt@iastate.edu

@SchmidtCrawford

President, Iowa Association of Colleges for Teacher Education (IACTE)

Past- President, Society for Information Technology and Teacher Education (SITE)

Apple Distinguished Educator (2003)

From: Tina Lauer
Date: Sunday, November 15, 2020 at 2:02 PM
To: "Crawford, Denise A [SOE]"
Subject: TPACK survey request for use

Hello Dr. Schmidt,

I am an educational doctoral student at Lindenwood University in St. Charles, MO. I am beginning the process of dissertation writing. In my position as an instructional technology specialist, I have used ideas from the TPACK framework with the teachers in my district. In this new virtual setting of teaching, it is imperative that teachers not only know their content area but that they understand the technology side of teaching, too. I would like to use some of the questions in the TPACK survey in my qualitative research study. I will be studying teachers' perceptions of their effectiveness in virtual teaching settings and would like to include some of the technology and pedagogy questions in my survey for my dissertation. I am writing to request permission to use parts of the TPACK survey in my study.

Thank you,

Tina Lauer

Appendix F

School Effectiveness (SE) Index: open-source survey tool

Wayne K. Hoy

Fawcett Professor Emeritus in Educational Administration

Search

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School Effectiveness

School Effectiveness Index (SE-Index)

SE Index

The **School Effectiveness Index** (SE Index) is an 8-item Likert-type scale that provides a collective, subjective judgment of the overall effectiveness of a school along five dimensions: quantity and quality of product, efficiency, adaptability, and flexibility.

A perceived measure of organizational effectiveness using these dimensions was first developed by Mott (1972) and proved to be a valid and reliable measure of effectiveness in hospitals. The Mott scale was adapted and used in schools first by Miskel and his colleagues (1979) and then by Hoy and his colleagues (Hoy & Ferguson, 1985; Hoy & Miskel, 1991; Hoy, Tarter, & Kottkamp, 1991). The index has been refined over several iterations. The most recent school effectiveness index (SE Index) can be downloaded at this site.

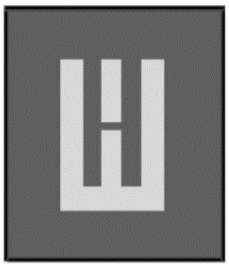
Reliability and Validity of the SE Index

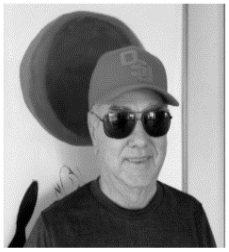
The eight items of the SE Index measures the degree to which a school is perceived to be effective by its faculty. Teachers are asked to describe the operation and performance of their school along a 6-point Likert scale from strongly disagree to strongly agree – the higher the score, the greater the effectiveness of the school.

The reliability of the scale is consistently high with alpha coefficients ranging from .87 to .89 (Hoy & Ferguson, 1985; Hoy, Tarter, & Kottkamp, 1991; Miskel, Fevurly, & Stewart, 1979).

Validity of the SE Index was supported in a comprehensive study of high schools using multiple criteria of school effectiveness, including student achievement, commitment of teachers, and assessments of experts (Hoy & Ferguson, 1985).

Search





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- Laws, Principles, and Rules
- Musings
- Strategies for Action

Scoring

The SE Index is a measure of school effectiveness, which is a collective (school-level) variable, not an individual one. Accordingly, the teachers' scores in each school are aggregated to the school level.

Step 1: Score the responses for each teacher and sum the scores; make sure that each teacher has responded to all eight items.

Step 2: Average all the teachers' scores in each school to get an effectiveness score for that school.

We have not developed norms for schools; hence, the index should be used for research purposes rather than to compare your school score with some normative group.

Click here to download a copy of the School Effectiveness Index 

References:

Hoy, W. K. & Ferguson, J. (1985). A theoretical framework and exploration of organizational effectiveness in schools. *Educational Administration Quarterly*, 21, 117-134.

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Appendix G

IRB Approval

IRB-21-119 - Initial: Exempt - Approved

do-not-reply@cayuse.com <do-not-reply@cayuse.com>
Mon 5/17/2021 11:11 AM
To: Ramey, Jackie <JRamey@lindenwood.edu>; KML946@lindenwood.edu <KML946@lindenwood.edu>

May 17, 2021 11:11:17 AM CDT

RE:
IRB-21-119: Initial - A qualitative study of teacher perceptions on virtual instruction during the COVID-19 pandemic in a Midwest public school district

Dear Kristina Lauer,

The study, A qualitative study of teacher perceptions on virtual instruction during the COVID-19 pandemic in a Midwest public school district, has been Approved as Exempt.

Category: Category 1. Research, conducted in established or commonly accepted educational settings, that specifically involves normal educational practices that are not likely to adversely impact students' opportunity to learn required educational content or the assessment of educators who provide instruction. This includes most research on regular and special education instructional strategies, and research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

The submission was approved on May 17, 2021.

Here are the findings:

Regulatory Determinations

- This study has been determined to be minimal risk because the research is not obtaining data considered sensitive information or performing interventions posing harm greater than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.

Sincerely,
Lindenwood University (lindenwood) Institutional Review Board

Appendix H

Informed Consent

LINDENWOOD

Survey Research Consent Form

A qualitative study of teacher perceptions on virtual instruction during the COVID-19 pandemic in a Midwest public school district

You are asked to participate in a survey being conducted by Kristina "Tina" Lauer under the guidance of Dr. Jackie Ramey at Lindenwood University. We are doing this study to gain insight on teacher efficacy in virtual teaching environments to help plan for future professional development and to determine what worked, what did not, and what recommendations can be made to improve these environments. It will take about 20-30 minutes to complete this survey.

Answering this survey is voluntary. We will be asking about 50 other people to answer these questions. At the end of the survey, you will be asked if you consent to participate in an additional interview in person or via Zoom. The interviews, if conducted, will be brief and only take approximately 20 - 30 minutes of your time.

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 possibly identify you, but all survey responses and/or interview notes 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- or mleary@lindenwood.edu. You can contact the researcher, Kristina "Tina" Lauer directly at 636- or kml946@lindenwood.edu. You may also contact Dr. Jackie Ramey at jramey@lindenwood.edu.

By clicking the button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

I consent, begin the study

I do not consent, I do not wish to participate

Please sign below for informed consent.

Appendix I

Permission to use 5 Cs of Transformational Leadership Figure

New message

Terry Hildebrandt, PhD, MCC, MCEC
CEO, Executive Coach, Organization Development Consultant, Coach Educator, and Coaching Supervisor

use of figure in your article - Transformational Leadership

Hello Dr. Hildebrandt,

I am a graduate student at Lindenwood University and am writing my dissertation on Teacher Perspectives during the COVID-19 pandemic. As I was researching school effectiveness and leadership qualities, I discovered your article on Transformation Leadership. I would like to have permission to use the figure in the article that describes the 5 Cs of Transformational Leadership. I would provide proper attribution of the article in my dissertation.

Thank you for your consideration of this request.

Tina Lauer
Lindenwood University
Graduate Student

Terry Hildebrandt, PhD, MCC, MCEC (He/Him) • 10:00 AM

Hi Tina:

I assume you mean the article from Choice Magazine? If so, let me verify with the publisher.

Thanks,

Terry H. Hildebrandt, PhD, MCC, MCEC
Master Corporate Executive Coach
Organization Development Consultant
Certified Coaching Supervisor
+1 (720) 318-6625
email:
Skype: ter
Follow me http://twitter.com/thhildebrandt
www.linkedin.com/in/terryhildebrandt
facebook.com/terryhildebrandtandassoc
www.terryhildebrandt.com

JAN 19

Tina Lauer • 11:56 AM

Yes. That is the one. Thank you. I would greatly appreciate that.

TUESDAY

Terry Hildebrandt, PhD, MCC, MCEC (He/Him) • 9:42 AM

Will do

THURSDAY

Terry Hildebrandt, PhD, MCC, MCEC (He/Him) • 11:23 AM

Hi Tina:

You have official approval to use the diagram.

Thanks,

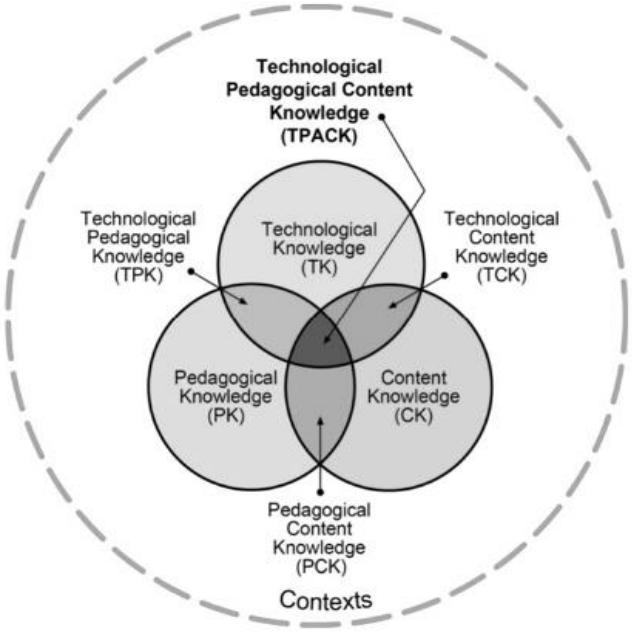
Terry H. Hildebrandt, PhD, MCC, MCEC
Master Corporate Executive Coach
Organization Development Consultant
Certified Coaching Supervisor
+1 (720) 318-6625
email:
Skype: terry.hildebrandt
Follow me http://twitter.com/thhildebrandt
www.linkedin.com/in/terryhildebrandt
facebook.com/terryhildebrandtandassoc
www.terryhildebrandt.com

Appendix J

Permission for use of TPACK image

Using the TPACK Image

Published on May 11, 2011 by mkoehler



The TPACK image (rights free). Read below to learn how to use the image in your own works. Right click to download the high-resolution version of this image.

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Vitae

Tina Lauer

Employment

Lindenwood University, St. Charles, MO – Adjunct Professor, College of Education and Human Services, August 2013 – present

City of St. Charles School District (St. Charles R-VI), St. Charles, MO – Instructional Technology Specialist (other positions held within the district include 6th-8th grade Reading Specialist, 6th grade English Language Arts, 6th grade Social Studies, 4th grade, 1st grade), August 1999 – present

Northwest School District, House Springs, MO – Elementary Reading Specialist, August 1997 – June 1999

St. Louis Public Schools, St. Louis, MO – Title I Preschool Educator, October 1995 – June 1997

Hilltop Academy, Olivette, MO – Preschool Educator, August 1992 – October 1995

Pattonville School District, St. Ann, MO – Elementary Paraprofessional – August 1991 – June 1992

Education

Ed.D. in Leadership (curriculum and instruction emphasis) expected fall 2022, Lindenwood University, St. Charles, MO

MA in Education with specialization in reading, spring 1998, Lindenwood University, St. Charles, MO

BS in Early Childhood Education, spring 1991, University of Missouri – St. Louis

Membership Affiliations

International Society for Technology Education

Educational Technology Association of St. Louis (board member)

Conferences and Local Presentations

2022 - International Society for Educational Technology (ISTE), New Orleans, LA; MOREnet, Osage Beach, MO

2021 – MOREnet, Branson, MO; IgnitED – Jackson, MO

2020 – Midwest Educational Technology Conference (METC), virtual conference

2019 – ISTE, Philadelphia, PA; METC, St. Charles, MO; METC Summer Institute, Town and Country, MO

2018 – METC, St. Charles, MO; ISTE, Chicago, IL; MO Summit for Google in Education, St. Charles, MO; METC Summer Institute, Orchard Farm, MO; MOREnet, Osage Beach, MO

2017 – MO Summit for Google in Education, Fenton, MO

2016 – MO Summit for Google in Education, Ballwin, MO; MOREnet, St. Louis, MO

2015 – MO Summit for Google in Education, Wentzville, MO; Education Plus, St. Louis, MO; MOREnet, Columbia, MO, Missouri State Teachers Association Conference, Columbia, MO

2014 – MO Summit for Google in Education, Maplewood, MO; METC, St. Charles, MO

Awards/Honors

Spotlight Educator – Midwest Educational Technology Conference, St. Charles, MO

Alpha Chi National Honor Society – Lindenwood University, St. Charles, MO

Outstanding Team Award (presented to the St. Charles R-VI School District STEM Integration Quality leadership team)– Missouri Staff Development Council, Lake Ozark, MO

Commissioner's Award for Excellence in Professional Learning (presented to the St. Charles R-VI School District Professional Development Committee) – Missouri Staff Development Council, Osage Beach, MO

Certifications

MO Teacher Certifications – Early Childhood (Birth-3rd grade), Elementary Education (1st-6th grade), Special Reading (K-12th grade)

Google Workspace for Education Certifications – Educator Level 1, Educator Level 2, Innovator, and Trainer

Discovery Education STAR Educator

BrainPOP Certified Educator

Kami Certified Educator Level 1

Screencastify Master Screencaster, Skilled Submitter, and Genius

Project Lead the Way (PLTW) Launch Lead Teacher

Publications

Spotlight in Education 2018, contributing author – EduMatch, 2018