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Primary Teacher Experiences with Kinesthetic and Tactile Learning in Virtual Settings

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Walden University

College of Education and Human Sciences

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Audrey L. Bryant

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Walden University
2023

Abstract

Primary Teacher Experiences With Kinesthetic and Tactile Learning in Virtual Settings

Audrey L. Bryant

MPhil, Walden University, 2022

MLS, San Jose State University, 1983

BA, Notre Dame de Namur University, 1978

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Education

Walden University

June 2023

Abstract

The primary grade levels traditionally consist of highly kinesthetic and tactile activities supporting learning and student engagement. During the COVID-19 pandemic, teachers urgently transitioned these learning activities to virtual settings. However, research shows a need for more literature on primary teacher experiences and their move toward innovative learning activities during the COVID-19 pandemic. The purpose of this study was to explore primary teacher experiences with kinesthetics and tactile activities in virtual settings. The combined conceptual framework of the study were Dewey's theories on active learning and Siemens' theory on the changing curriculum and learning in virtual settings. Eight primary teachers selected by purposeful sampling contributed in-depth information relevant to this study during semistructured interviews. They were from Facebook Groups, public school districts, the snowball technique, and a participant pool. Data analysis consisted of inductive thematic analysis and showed that teachers implemented kinesthetic and tactile activities through software resources and Zoom conferencing. They created and modified new lessons to adapt to the online multimodal curriculum. The five themes developed from the data analysis described the participants' chosen kinesthetic and tactile activities, software, adapted lessons from in person education, student engagement, and shared opportunities for improving future learning activities in virtual settings. The findings of this study might contribute to social change by providing information to improve primary instruction in virtual settings.

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Dedication

This study is dedicated to my sons, Nathan, Jonathan, and Christopher. I dedicate this study dedication to my daughter and her husband, Nathalie and Nicholas. My dedication goes to my grandchildren, Christopher, Jr., Michael, Tenacious, Trinity, Nicholai, and Lauryn. I stand to represent my family and ancestry. I dedicate this study to everyone who can make the people around them smile by doing things great or small. I love you all.

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Chapter 1: Introduction to the Study

Education with kinesthetics and tactile activities is a part of the primary grade-level curriculum (Bartnæs & Myrstad, 2022). During the COVID-19 pandemic, school closures caused primary teachers to pivot their curriculum to virtual settings (Nikolopoulou, 2022). This study addressed primary teacher experiences with implementing kinesthetic and tactile learning in virtual settings. Eight primary teachers participated in the study. For the purposes of this study, I defined the primary level as preschool through second grade (Kearns & Hiebert, 2022). The primary level uses physical activities to help students to learn and comprehend information.

In response to disrupted teaching and learning during the COVID-19 pandemic, the United Nations Educational, Scientific, and Cultural Organization (UNESCO; 2020) created a teachers' guide for virtual settings. In the guide, teachers were encouraged to develop multisensory activities and access multimodal online environments to achieve learning that effectively meets students' needs. Research was conducted to understand teachers' experiences with kinesthetic and tactile activities during the pivot to virtual settings (Albeta et al., 2021; Bartnæs & Myrstad, 2022; Meda & Mohebi, 2021; Stamm et al., 2021; Tobin et al., 2021). The potential social implications of the study were to improve the teaching and learning activities in virtual settings. Educators might gain an in-depth understanding of the challenges solved by creativeness from teachers' experiences, improving the holistic approach to education and enhancing student engagement and social activities for primary learning with kinesthetic and tactile activities.

In Chapter 1, I will provide the background information related to the scope of the topic. It will include the problem statement and evidence of consensus that the problem is current, relevant, and significant to the discipline. I will describe the literature gap and explain the need for research in the discipline. I will present the study's research question. The conceptual framework supported the research question from the contextual lens of two education theories. The framework's key elements were logical connections, with references thoroughly explained in Chapter 2. The nature of the study is a summary of the methodology, design, and key concepts. The section will include definitions with citations to clarify terms with multiple meanings. I will describe the study's assumptions, boundaries, delimitations, and limitations. Lastly, I will identify potential contributions to advancing knowledge and practice to the significance and include potential implications for positive social change.

Background

Researchers in the field have suggested that studies should focus on understanding teacher experiences with the urgent transition to virtual settings due to the COVID-19 pandemic (Hysa et al., 2022; Johnson et al., 2022; Korkmaz & Toraman, 2020; McKenna et al., 2021; Miulescu, 2020; Wagner, 2021). Researchers suggested that future studies should focus on kinesthetic and tactile learning in virtual settings because it requires a teaching design for student learning preferences (Almasri, 2022; Stamm et al., 2021; Tvaltvadze & Gvelesiani, 2021).

The research literature related to the scope of the study topic has been the basis for the emergent themes of this study. Students used experiences such as physical

movements and touch to process information (Breive & Carlsen, 2021; Cuturi et al., 2022; Frödén & Tellgren, 2020; Johnson & Avetisian-Cochran, 2021; Zhou, 2022). Most primary students are active learners. They learn by doing to process and comprehend information (Breive & Carlsen, 2021; Johnson & Avetisian-Cochran, 2021). Teaching and learning are multisensory by combining physical movement and auditory to process information for learning (Mohamed, 2022; Schukraft, 2020). Hands and feet coordinate with memorization (Prihartanta et al., 2022; Suryaningsih et al., 2021). Students have different learning preferences (Danniels & Pyle, 2022; Hermini et al., 2021; Stamm et al., 2021). The literature justified the rationale for selecting concepts to support 21st-century skills (Hsu et al., 2022; Malkawi & Khayrullina, 2021; Viana & Peralta, 2021). Content learning starts with primary and preschool teachers (Aljaberi, 2021; Mabrouk, 2021; Zoupidis et al., 2022). The review of the literature indicates that kinesthetic and tactile learning help students who need more than visual and auditory learning.

The gap in knowledge in the discipline that this study addressed was primary teacher challenges with implementing kinesthetic and tactile learning in virtual settings during the COVID-19 pandemic. United Nations Educational, Scientific and Cultural Organization UNESCO (2020) guidelines suggested that teachers use multisensory activities and access multimodal online environments to make online learning an extension comparable to in person learning. Multisensory activities are highly kinesthetic and tactile activities for the primary curriculum.

The literature review confirmed a need for a qualitative study with primary source data that provides an in-depth understanding of primary teachers who continued using kinesthetic and tactile learning in virtual settings. My study focused on adding knowledge and experience to the literature from primary teachers' experiences who pivoted to virtual settings during the COVID-19 pandemic. Exploring teachers' experiences provided new information that addressed the challenges and solutions of primary teachers' innovative kinesthetic and tactile learning in virtual settings, which was the gap in the literature. The results could help to improve learning activities to better meet students' academic and social needs. The study's implications inform early-education teachers to take advantage of the software and teaching aids that can assist in implementing kinesthetic and tactile activities in virtual settings. The results filled the identified gap and supported seeking innovative primary grade learning activities during the pivot to virtual settings. Teachers' awareness of learning preferences enhances their ability to improve student engagement. Teachers' awareness of learning preferences enhances their ability to improve student engagement.

Problem Statement

The problem related to this study was that the COVID-19 pandemic caused disrupted education. UNESCO (2020) published a teachers' guide for online learning using multimodal and multisensory activities. Multisensory activities are visual, verbal, auditory, kinesthetic, and tactile, which improve knowledge and remembering (Schukraft, 2020). Kinesthetic and tactile learners process information through manipulation, feeling or touching (Hermini et al., 2021; Perdaniama, 2021; Spezini, 2021; Stamm et al., 2021).

Traditional primary grade level instruction is holistic, including academic and social skills (Bautista et al., 2021; Brifkani, 2021; Wrathall, 2021). Longitudinal studies have proven that students who are successful in primary learning are more likely to be successful, productive adults. (Ramsook et al., 2020). Traditional primary grade level activities include highly kinesthetic and tactile activities that support processing and comprehension (Bøg et al., 2021; Perdaniama, 2021; Sarouphim, 2021; Schraeder et al., 2021). Although the use of kinesthetic learning and tactile movement activities to increase processing and deep comprehension in primary learning is understood and well supported in the literature (Culp et al., 2020; Rostan et al., 2021), there is a paucity of literature regarding the use of kinesthetic learning in virtual settings (Albeta et al., 2021; Bartnæs & Myrstad, 2022; Meda & Mohebi, 2021; Stamm et al., 2021; Tobin et al., 2021).

Recent research in the field indicates the need for studies focusing on understanding teacher experiences during the transition to virtual settings caused by the COVID-19 pandemic (Korkmaz & Toraman, 2020; Magen-Nagar & Firstater, 2019; McKenna et al., 2021; Miulescu, 2020; Wagner, 2021). Researchers suggested that future research focus on kinesthetic and tactile learning in virtual settings because it requires a teaching design for student learning preferences (Stamm et al., 2021; Tvaltvadze & Gvelesiani, 2021). The use of kinesthetic and tactile activities has helped students thrive in primary grade levels for teaching and learning (ArgoPrep, n.d.; Cerezci, 2021; Rostan et al., 2021); however, the problem was that there was little literature on how primary teachers innovated instruction by using kinesthetic and tactile learning in virtual settings

during COVID-19. I addressed the gap through qualitative research by exploring primary teacher experiences with implementing kinesthetic and tactile activities in virtual settings to reach a consensus to frame knowledge and best practices. This consensus could be a model for providing primary teachers with educational experiences for kinesthetic students.

Purpose of the Study

The purpose of this qualitative study was to explore primary teacher experiences with implementing innovative kinesthetic and tactile learning in virtual settings. Exploring kinesthetic and tactile learning in virtual settings for primary grades might increase an understanding about improving future kinesthetic learning activities for primary students. Discovering more about kinesthetic and tactile activities could fill a research gap to inform primary teachers of the various choices available to help improve processing information and comprehension while learning in virtual settings. The research findings might increase teachers' self-efficacy in identifying learning preferences to motivate continual learning.

Research Question

Research question: What are primary teacher experiences with implementing kinesthetic and tactile learning in virtual settings?

Conceptual Framework for the Study

This basic qualitative study consisted of a combined conceptual framework of Dewey's (1938, 2009) pragmatic constructivism theory and Siemens's (2005) connectivism theory. The conceptual framework supported learning with integrated

technology with contextual lenses to improve students' ability to learn and socially connect during a disrupted pedagogy.

Dewey's (1938, 2009) pragmatism theory supports knowledge as an opportunity for social activity in an integrated world. Dewey's concept of education focuses on motivating students to be active participants, such as through hands-on learning. Dewey's theory of transformation calls for removing the learning limitations of early childhood learners to improve social behavior and academic growth. One of Dewey's curriculum ideas is that learning would constantly change during a child's educational journey. His pragmatism theory involves seeking practical and useful insights that provide information to help solve a problem (Patton, 2014). Real-world constraints, such as limited time and resources, are the basis of the decision methods. Constructivism supports the belief that each person has a unique experience, and their way of making sense of their experience is valid.

Siemens's (2005) connectivism theory was built upon Dewey's (1938, 2009) pragmatic constructivism theory using internet technology, where technological improvements should meet student learning through hands-on activities and digital play. Siemens's connectivism suggests that internet technology could contribute to new learning formats. His connectivism theory also mentions chances for creativity in virtual teaching to improve student learning objectives. Teacher experiences with primary student learning included how student connections in virtual settings increased or decreased learning and social skills during the COVID-19 pandemic. One of Siemens's basic principles concerned diverse learning opinions, which logically connected to this

study that teachers made learning activity and technology choices for their students as they implemented learning in virtual settings.

The combined framework supported the instrumentation development and the interview guide by presenting ideas to consider the innovations of kinesthetic and tactile learning primary teachers used in virtual settings during the COVID-19 pandemic. Their ideas contributed to data analysis after semistructured interviews provided concepts with trends, content, and experiences. The concepts added to the emergent themes support the research question. For more details about the conceptual framework and its relation to other pragmatic and constructivist theories and a thorough explanation of the logical connections to the study's key elements, refer to Chapter 2, Literature Review.

Nature of the Study

In this basic qualitative study, I interviewed eight primary teachers who shifted to virtual learning during the COVID-19 pandemic. I expected six to eight participants to provide enough data for themes to emerge during the qualitative analysis (Guest et al., 2006; Mason, 2010; Patton, 2014). I purposely chose a sampling of primary teachers for this study. I recruited primary teachers who transitioned to or implemented kinesthetic and tactile activities in virtual settings during COVID-19. The primary grade levels include a curriculum with learning activities. Therefore, I needed a purposeful sampling of primary teachers implementing the innovation to share their experiences with kinesthetic and tactile learning after education transitioned into virtual teaching and learning.

The study's conceptual frameworks included Dewey's (1938, 2009) pragmatic constructivism theory and Siemens's (2005) connectivism theory. The combined conceptual framework supported the problem, purpose, and research question and kept the study's focus on kinesthetic and tactile activities in virtual settings. I used Saldaña's (2021) descriptive analysis approach with In Vivo coding and initial coding to capture content and experiences. Then, I used Pattern coding to categorize and emerge concepts needed to theme the data. Moreover, I used Lincoln and Guba's (1985) approach to researcher reflexivity, ensuring accurate descriptions to encompass participant experience carefully. To increase the feasibility of the study, I sent calls for participation via social media resources, Facebook, Twitter, and LinkedIn. Also, I sent calls for participants to school districts, education associations, a research participant pool, and snowballing of participants.

Definitions

Centers: Centers refers to instructors creating a space for students to collaborate or work individually to practice what they learned with hands-on activities using manipulatives. Examples of centers include math, art, reading, or building. In person learning had digital centers with computers and iPads that accessed online learning materials. Most centers are routine and allow students to know what to do automatically (Balla-Elliot, 2022; Miss Kindergarten, 2022).

COVID-19 pandemic: In March 2020, an infectious disease caused by the SARS-CoV-2 affected people worldwide UNESCO (2020). The virus consisted of mild to moderate symptoms involving the respiratory system. Many schools closed due to the

virus and its variants (Beattie et al., 2022). The pandemic forced disrupted education, causing educators to rapidly pivot their curriculum from in person to online teaching (Cesari et al., 2021).

Kinesthetic: Kinesthetic learners prefer receiving information through tactile senses rather than written, visual, or auditory input; they learn best by performing tasks and physically. This definition excludes tactile concepts to distinguish differences between kinesthetic activities and tactile activities as they were used in data analysis. Tactile activities were physical touch, the touch screen, hands-on activities for phonics or reading, sign language, and any activity coded under tactile in this study. Kinesthetic refers to physical movement providing sensory information from muscles, joints and fibers (Stamm et al., 2021). Kinesthetic learning is often misrepresented as tactile or hands-on learning; however, it requires a total body approach to be most effective (Brian & Goodway, 2021). The learning involves being physically active at the primary grade levels (Elisavet, 2021).

Manipulatives: Manipulatives refer to concrete materials that students touch. They are available for all subjects. With instructor guidance, touching and sharing ideas about manipulatives increases learning and memory. Other names for manipulatives are concrete, tangibles, and teaching aids. Examples are base 10 blocks and playdough, or Play-Doh. Examples of physical manipulation are catching, kicking, punting, two-hand striking (e.g., hitting a ball with a bat or racquet), and throwing (Brian & Goodway, 2021). Learning software consists of virtual manipulatives that link to classroom practice (Quigley, 2021). An example is selecting and moving alphabet letters. Instructors

combine physical and digital learning by incorporating the physical touch of real-world items with digital learning. (Cuturi et al., 2022).

Multisensory / multimodal: Multisensory refers to applying more than one learning style or platform to the curriculum. Learning activities can include a mixture of senses; for example, teaching reading visually includes kinesthetic, tactile, visual, and auditory. Multisensory learning has been strongly supported by the Montessorian approach (Cesari et al., 2021; Hasbrouck, 2021).

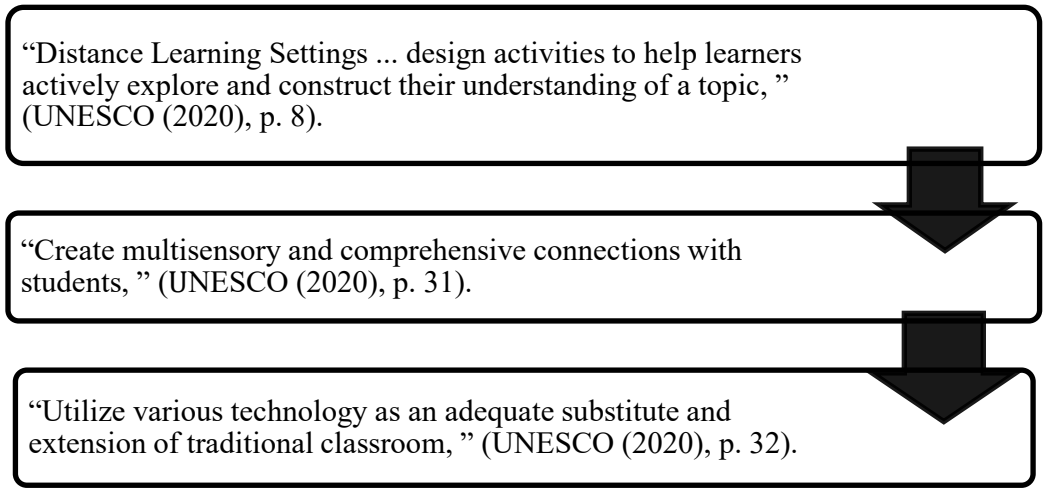
Psychomotor: Psychomotor refers to assessing the total body stage of a psychomotor skill and plotting it against an age-related norm, which can provide an instructor with a snapshot of a child's performance from a kinesthetic learning standpoint. Identification of a child's developmental stage for a skill also allows the teacher to determine whether an activity is appropriate, and it assists in aligning kinesthetic movement conditions to the child's developmental level (Brian & Goodway, 2021).

Tactile: Tactile learners require the sense of touch to learn at their best and remember information. This definition excludes kinesthetic concepts to distinguish differences between tactile activities and kinesthetic activities as they were used in data analysis. Kinesthetic activities are running, jumping, sitting, taking breaks, arts, and music. Tactile includes hands-on activities, screen touch, sign language, hand signals, and touching objects while learning in Zoom. The best way to teach tactile learners is to involve their hands (Carpenter, 2020; Nikolopoulou, 2022).

UNESCO (2020): The United Nations Educational, Scientific, and Cultural Organization provided guidelines for online learning during mandated school closures. During the COVID-19 pandemic, UNESCO's response to disrupted education encouraged teachers to use multisensory activities and access multimodal online environments to help achieve student outcomes. Multisensory activities can be a combination of kinesthetic and tactile activities. See Figure 1 for quotes that define which portions of the UNESCO document supports the importance of the study in literature. The quotes address multisensory, technology, and what to design for online activities.

Figure 1

Defining How UNESCO (2020) Supports the Study



Note. This model consists of quotes from United Nations Educational, Scientific, and Cultural Organization to help confirm the study's importance in literature.

Assumptions

I assumed participants were honest about their inclusion criteria and appropriately self-selected in response to my invitation. I looked for primary teachers who transitioned to or implemented kinesthetic and tactile learning activities in virtual settings, and they taught in a COVID-19 virtual context. According to Ravitch and Carl (2016), participants in every research study have different realities. Therefore, I assumed that the participants were fair, ethical, forthcoming, and open with their answers.

Scope and Delimitations

The scope of my qualitative research was to engage in understanding and reporting on primary teachers' experiences with kinesthetic and tactile learning in virtual settings. The study did not include designers of virtual settings. Also, the study did not include teachers who only taught kinesthetic and tactile activities in a face-to-face environment.

The purposeful sampling included eight primary teachers. I chose primary teachers experienced with including kinesthetic and tactile activities in their curriculum to ensure they could provide relevant information to this study. Teachers at third-grade positions and up were not part of the inclusion criteria because their curricula differed from the holistic primary grade level curricula. I did not interview participants who were coworkers from where I was employed. I did not exclude participants because of their race, gender, socioeconomic status, or region. Qualitative research contains transferability when researchers can use the study in similar situations in different or broader populations. The primary curriculum includes kinesthetic and tactile activities,

and potential transferability may extend to primary teachers as a developmental learning opportunity.

Limitations

This study was limited to primary teachers who taught pre-kindergarten through second-grade students. The selection criteria did not specify the years of teaching with kinesthetic and tactile activities in virtual settings. These limitations ensured that the participants could provide information relevant to the study. The selection criteria allowed more teachers to respond to my invitation to participate.

My lack of interviewing experience might have impacted interviews and data analysis because I am a novice researcher. However, I provided the participants with rich content, given how I conducted the study. I provided excerpts from the participants' interview transcripts for the reader to understand and connect with virtual settings. The findings of this study may be generalized to other educational settings to innovate virtual learning at the primary grade levels. Lastly, I provided detailed descriptions of the data analysis process.

Barriers to the study arose because the study occurred at a time unsuitable for recruitment and data collection. Many primary teachers had already returned to the classroom setting. Therefore, I ensured that my role as a researcher remained unbiased by using reflective research processes.

Significance

This study could fill a gap in the literature by providing an insight into kinesthetic and tactile teaching and learning in virtual settings during the COVID-19 pandemic. The

research was unique because it focused on primary teacher experiences with implementing kinesthetic and tactile learning in virtual settings during the COVID-19 pandemic. The findings made an original contribution to the field by informing primary teachers of the challenges and advantages of virtual learning as they return to the classroom and for students whose parents decided to continue with virtual learning. The study results promoted positive social change by recommending strategies to improve education for future disrupted learning in primary education. The findings may enable students to reach higher learning goals and motivate continued kinesthetic learning in virtual settings. Also, the findings can inform primary teachers about taking advantage of multimodal learning strategies. Primary teachers should be aware of the learning preferences that enhance students' ability to process information. The research results could make a difference for teachers interested in using kinesthetic and tactile learning to improve student engagement in virtual settings.

Summary

In summary, the disruption in learning due to the COVID-19 pandemic caused UNESCO (2020) to encourage teachers to create multisensory activities in virtual settings compatible with face-to-face learning. The research question guiding this basic qualitative study was: What are primary teacher experiences with implementing kinesthetic and tactile learning in virtual settings? It aligned with the purpose statement and the combined conceptual framework of Dewey's (1938, 2009) pragmatic constructivism and Siemens's (2005) connectivism theory. The purpose of this qualitative study was to explore primary teacher experiences with implementing innovative

kinesthetic and tactile learning in virtual settings. Exploring kinesthetic and tactile learning in virtual settings for primary grades might increase an understanding about improving future kinesthetic learning activities for primary students. A paucity of information exists concerning these challenges and advantages of virtual settings. The data collection consisted of semistructured interviews from a purposeful sampling of participants from Facebook, the public elementary schools, snowballing, and a participant pool. This study was limited to primary teachers who transitioned to or implemented kinesthetic and tactile learning activities virtually during the COVID-19 pandemic. Their expertise and perceptions added information regarding their experiences.

Chapter 2 will include a list of accessed library databases and search engines for the keywords related to the conceptual framework and key concepts. I will discuss the connection of the conceptual framework to this study. Moreover, I will review studies found by the keywords that further justify the purpose of the research question and further explain the gap of the study.

Chapter 2: Literature Review

During the COVID-19 pandemic, teachers transitioned from in person learning to virtual settings. The UNESCO (2020) teachers' guide encouraged teachers to create natural stages of traditional learning that included multisensory activities. Multisensory activities involve visual, verbal, auditory, kinesthetic, and tactile activities to increase student engagement and knowledge transfer. Throughout the lesson, teachers can layer these activities to create a strong topic foundation (Schukraft, 2020). Highly kinesthetic and tactile activities are part of the traditional primary curriculum (Bøg et al., 2021; Perdaniama, 2021; Sarouphim, 2021; Stamm et al., 2021); the problem was primary teachers faced challenges with the innovation of kinesthetic and tactile learning in virtual settings. A paucity of literature exists regarding the use of kinesthetic learning in virtual settings (Albeta et al., 2021; Bartnæs & Myrstad, 2022; Meda & Mohebi, 2021; Stamm et al., 2021; Tobin et al., 2021).

The purpose of this qualitative study was to explore primary teacher experiences with implementing innovative kinesthetic and tactile learning in virtual settings. Exploring kinesthetic and tactile learning in virtual settings for primary grades might increase an understanding about improving future kinesthetic learning activities for primary students. The traditional primary curriculum is holistic, including a wide range of academic and social skills (Bautista et al., 2021; Brifkani, 2021; Wrathall, 2021). Longitudinal studies have proven that students who are successful in primary grades are more likely to be successful, productive adults (Ramsook et al., 2020). Exploring primary kinesthetic and tactile activities in virtual settings might increase awareness of available

teaching options for addressing students' learning preferences. The goal of this study is to understand teachers' challenges with transitioning to or implementing kinesthetic and tactile learning in virtual settings.

Recent research in the field identified the need for studies focusing teacher experiences during the transition to virtual settings caused by the COVID-19 pandemic (Korkmaz & Toraman, 2020; McKenna et al., 2021; Miulescu, 2020; Wagner, 2021). Understanding teacher experiences might contribute to the literature on how teachers can create kinesthetic and tactile activities for primary virtual settings that increase information processing and improve remembering.

In Chapter 2, I begin with my literature search strategy. The research articles it includes are peer-reviewed and published within 5 years. Next, I discuss the combined conceptual framework. The theorists are Dewey (1938, 2009) and Siemens (2005). The combined conceptual framework aligns with and supports the problem, purpose statement, research question, and methodology. I will include an overview of the evolution of kinesthetic and tactile activities in the traditional primary classroom. The overview of technology integrating the primary activities comprises what is known and not known about kinesthetic teaching and learning. I will show why the research approach is meaningful. I organized Chapter 2 into four major sections: literature search strategy, conceptual framework, literature review related to the key concepts, and summary and conclusions.

Literature Search Strategy

The literature search strategy included search engines and library databases to access primary teacher experiences with implementing kinesthetic and tactile activities in virtual settings. To keep students safe during the COVID-19 pandemic, teachers pivoted their curricula activities to the virtual settings. The search engines included Google Scholar and Google Internet to locate news articles, and the Walden University Library gateway. The accessed databases were the American Psychological Association (APA) PsycInfo®, Educational Resource Information Center (ERIC) and Education Source Combined Search, ProQuest One Academic, SAGE Journals, and the Taylor & Francis Group. The key search terms include *COVID-19*, *Coronavirus*, *distance learning or distance education or online learning*, *inherent*, *K-12*, *college or university*, *elementary*, *primary*, *kindergarten or preschool or early childhood education*, *first grade*, *second grade*, *primary math*, *primary reading*, *primary social skills*, *kindergarten teachers*, *kinesthetic or kinaesthetic*, *multisensory*, *modality*, *remote learning*, *tactile or touch*, *teacher experiences*, *teacher perception or teacher opinions*, *UNESCO (United Nations Educational, Scientific, Cultural Organization)*, and *virtual settings.*

The search process included iterative term combinations in each database to identify germane scholarship. The research articles have a timeframe dating back 5 years. The search for seminal papers consisting of theories was not limited by publishing date. The majority of research articles are double-blind peer-reviewed, with a small number of news articles included for guidance on trends as they occurred during the COVID-19 pandemic. I used Walden's research article organizer to gather information concerning

the writings. In cases where there is little current research, I broadened key search terms to include grade levels from preschool through college.

Conceptual Framework

The concept explored in my study is the primary teacher's experiences with continuing kinesthetic and tactile activities during the transition from in person learning to virtual settings. The combined theories of pragmatic constructivism, developed by Dewey (1938, 2009), and connectivism, developed by Siemens (2005), make-up the framework of the study. The conceptual framework supported learning integrated with technology. I combined the theories to form a contextual lens to explore primary teacher experiences with implementing kinesthetic and tactile learning in virtual settings to increase understanding about students' ability to learn with kinesthetic and tactile activities in virtual settings. Together, the theories form an innovative lens to explore teachers' experiences with kinesthetic and tactile learning in virtual settings. I selected ideas from each theorist to build the conceptual framework. This framework provided a set of ideas to guide the study to ensure relevant data to answer the research question.

The following sections contain a synthesis of peer reviewed studies relevant to the purpose statement and supported by the theorists. I will provide key statements and definitions inherent in the framework. I will describe how the concept or phenomenon had been applied and articulated in previous research. Lastly, I will include a paragraph about how this study relates to each theorist of the combined framework.

Dewey's Active Learning

In the 20th century, Dewey (1938, 2009) introduced the continuity and interaction theory. Dewey studied child psychology. As an educator of school reform, Dewey developed ideas that included learning as social interaction. Students excel in education when they experience and interact with the curriculum. Dewey's (1938) studies enabled him to introduce his philosophies on teaching.

Today, Dewey's theories have continued to provide a lens to help teachers engage students in learning. Dewey encouraged active learning. According to Kolb (2021), Dewey's constructivist approach is possible in virtual settings when teachers adapt or are creative with education software. His theories apply to learning activities even outside the classroom (Winstanley, 2018). Dewey's (1938, 2009) pragmatism theory suggests that learning comes from experience. Students learn actively from hands-on experiences (Winstanley, 2018). Dewey's (1938, 2009) pragmatism focuses on motivating students to become active participants in learning. His continuity and interaction theory defines continuity as teacher-involved experiences that build understanding. Interaction includes previous experiences influencing present learning (Winstanley, 2018). While participating in educational activities, students learn by being aware that they are part of their culture (Shilling, 2021). Positive experiences increase self-confidence and support continual learning (Winstanley, 2018). When educators understand how their students learn, they can improve constructive primary activities to create positive experiences that start more learning opportunities.

Human experiences add ideas and individuality to make a topic and learning platform more engaging (Thorburn, 2018). Students depend upon their surrounding stimuli for learning (Dewey, 1938). Moreover, students should enjoy learning activities. These activities will help them develop future knowledge and understanding (Dewey, 1938; Winstanley, 2018). Students who retain previous experiences can use them to help solve complex problems (Frödén & Tellgren, 2020). Student participation develops the concepts that were taught to them (Dewey, 1938). For students to be successful, they should have satisfactory learning conditions. Experiences expand knowledge and social behavior with facts, ideas, and information. Interaction occurs when the learning experience connects to an individual or place.

Dewey's (1902) theory of transformation calls for removing the learning limitations of early childhood learners to improve social behavior and academic growth. One of Dewey's beliefs about traditional learning was that such education ignored learning processing (Tan, 2020). Preschool teachers who include guided free play create experiences that transform into learning (Frödén & Tellgren, 2020). Students are ready to explore, and teachers should guide them to meet students' learning goals (Dewey, 1902). Dewey stated that educators should transform students' interests into positive educational experiences to further learning. Dewey emphasized the importance of exploiting opportunities for transformation. Teachers can transform their curriculum by dividing it into parts to fit students' learning capabilities and environment.

Dewey (1915) recognized that the child and the curriculum produce knowledge from learning experiences. A learning transaction occurs when information processing includes an image of the world (Thorburn, 2018). Dewey explained that active learning does not take the place of learning materials. Active learning keeps students' attention and interest. Dewey suggested that active or hands-on learning is a better alternative to listening. Dewey also found that physical body requires active experiences for learning and personal growth. Hands-on activities allow students to learn by realizing. In this sense, physical and internal activity are inseparable.

Dewey (1915) suggested that the curriculum constantly changes during a child's educational journey. He stated that the intention of learning is to improve the quality of life and positively move forward from the past (Wraga, 2020). Dewey indicated that schools should relate to society through interaction, and this connection motivates and engages students in learning (Tan, 2020). Dewey realized that material equity was not available to everyone. Dewey further theorized that socioeconomic factors could shift educational practices and present opportunities for innovative change. For example, Dewey (1915) stated that during the French Revolution and the general revolution of 1848, the social conditions rapidly changed, resulting in the need to focus on public schools. Reconstruction of education was necessary to support a new society. Dewey mentioned that the curriculum might change during a student's educational journey. Therefore, a sudden disruption in learning could be an opportunity for teachers to develop learning activities beneficial for the class. Educators should center the individual and

social skills when unexpected learning revolutions occur. The process of pivoting or creating a new curriculum could be complex.

Applications to Current Research

Researchers continued to apply Dewey's theories as a basic guide on how to improve learning (Cerny, 2020; Frödén & Tellgren, 2020; Mabrouk, 2021; Shilling, 2021; Williams, 2017). In Breive and Carlsen's (2021) qualitative study, Dewey's beliefs supported the claim that sensory experiences help children learn and develop mathematics ideas. Learning should apply to everyday living and include students' interests. Their research aligned with Dewey's ideas because children form ideas in math through experience and fascination. The concept of experience and learning ties into progressive education where learning involves the whole student, such as social skills and learning.

Teachers design learning activities to involve students as active learners who acquire knowledge through their experiences. Breive and Carlsen (2021) indicated that multimodal activities such as using gestures and learning objects helps children with mathematical inquiries. A child is born to be active and will have many interests. Dewey (1938) held a strong belief in learning by doing. Dewey's learning theories promote active learning and concern for students' literacy and social well-being (Dewey, 2009). Johnson and Avetisian-Cochran (2021) indicated that literacy development occurs through students reading together in person because each contributes to the other's learning. Their qualitative study drew on Dewey's ideas on learning through collaborative research in early literacy through peer reading.

Participation and experience involving free play and social interaction for young learners to become problem solvers and knowledge experts with peers were the center of a field study conducted by Frödén and Tellgren (2020) and supported by Dewey's (1939) theories suggesting learning and retaining is through experience. The researcher's findings from semistructured interviews with preschool teachers suggested to improve student participation practices by providing opportunities for students engagement through education. Viana and Peralta (2021) stated that Dewey's learning theories value a student-centered curriculum and include their learning experiences. The student's environment is a mix of rapidly changing technology followed by societal changes, and those changes would affect the curriculum (Viana & Peralta, 2021). The curriculum should be interactive and experiential because these qualities are associated with information processing and remembering.

The Current Research Benefits From This Framework

This study includes Dewey's (1938, 2009) education theories as part of the conceptual framework because his ideas on education reform align with the emergency change to education during the COVID-19 pandemic. Students with kinesthetic and tactile learning preferences learn through active learning. Dewey indicated that learning includes instincts, experience, and individuality, which start the learning process. Education is continuous, wherein experience stimulates growth (Frödén & Tellgren, 2020). The curriculum will change during a student's educational journey (Dewey, 1938, 2009). Previous researchers used Dewey's education theories and studies on primary literacy, math, and social skills in virtual settings, which shows how his ideas can bridge

learning and technology with continuity and interactions. The theory supports my research question about primary teachers' experiences with learning as they pivoted their curriculum to virtual settings and students' learning needs. The first component of my conceptual framework helps continue structural alignment throughout each research phase. Education is a means of preparing students for the future workforce. Also, the theorist's ideas on active learning and social interactions continue to support education as the curriculum moves toward virtual settings. Learning in virtual settings allows students to apply this experience and interest to their learning. Primary education is an excellent start for virtual learning, where the social skills and learning will support them throughout their education and career. For this reason, segments of Dewey's theories make up the combined conceptual framework.

Siemens' Learning Through Connectivism

Siemens's (2005) connectivism theory embraces learning in the digital age. Siemens built the connectivism theory upon Dewey's (1938, 2009) pragmatism and constructivism theories. Also, connectivism integrates chaos theory, network-organized, complexity, and self-organization (Cerny, 2020; Corbett & Spinello, 2020; Ilic, 2021). Connectivism as a learning theory that began as a self-organized learning concept. The theory evolved along with the rapid changes in computer network technology (Ilic, 2021). Additionally, students began learning in a networked environment with or without instructors. Siemens sought to close the gap between traditional and online learning by providing new skills and tasks, allowing students to thrive in the digital age. In the digital age, most people rely on technology rather than textbooks to keep up with new

information, and monitor daily activities (Western Governors University, 2021). According to Cerny (2020), Siemens recognized technology as central to learning, and networks provide ways to gain and constantly update knowledge. Siemens' connectivism theory comprised of eight basic principles:

1. Learning and knowledge rests in diversity of opinions.
2. Learning is a process of connecting specialized nodes or information sources.
3. Learning may reside in non-human appliances.
4. Capacity to know more is more critical than what is currently known.
5. Nurturing and maintaining connections is needed to facilitate continual learning.
6. Ability to see connections between fields, ideas, and concepts is a core skill.
7. Currency (accurate, up-to-date knowledge) is the intent of all connectivism learning activities.
8. Decision making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. (Cerny, 2020, p. 14; Corbett & Spinello, 2020, p. 3; Korkmaz & Toraman, 2020, p. 294; Siemens, 2005, p. 4; Utecht & Keller, 2019, p.108).

Connectivity is a connection to an information source or database, experience, a learning process, and a group of learners (Malkawi & Khayrullina, 2021). Teachers apply this theory by creating connections for learning, building learning communities, and allowing students to experience knowledge within their learning environment (Zambrano

& Campuzano, 2020). Additionally, connectivism marked the beginning of the digital era of the Massive Open Online Course (MOOC) (Corbett & Spinello, 2020; Utecht & Keller, 2019). The connectivism learning theory includes recognizing the ever-changing educational platforms.

Siemens' (2005) connectivism theory defined the role of the student as dynamic. The networking environment continues to change rapidly. The continued updating creates links with new learning experiences during decision-making (Zambrano & Campuzano, 2020). Jimola and Ofodu (2021) described connectivism as knowledge and context flowing through the networks of humans and technology. Furthermore, the authors stated that connectivism eases space and time in the traditional classroom, where students can study at their own pace, and teachers present remotely. Siemens stated learning is connecting to information possible through technology. Humans store knowledge by making connections to past learning through a system of nodes. They save knowledge through these connections.

Application of Siemens' Connectivism in Previous Research

Researchers applied Siemens's (2005) connectivism theory to explore the impact of digital technology. Mangaroska et al. (2021) applied the connectivism theory to qualitative research addressing the human-centered design approaches of multimodal learning. The authors concluded that digital technology was not the most significant concern in learning—the problems aligned with Siemens' ethics, privacy, and data quality of technology. Malkawi and Khayrullina (2021) found connectivism supportive of the rapid digital world change that changes learning processes, communication, and

lifestyles. Knowledge does not transfer from the teacher to the student (Siemens, 2005); learning is the feeling of staying connected to society and digital technology. Siemens also described the process of learning as "what we need for tomorrow is more important than what we know today" (Malkawi & Khayrullina, 2021, p. 7.). The authors concluded that their study's participants believed an effective class design was imperative, and communication was a top priority of learning in digital technology. Connectivism is the evolvement from self to network with organized learning. According to Cerny (2020), critics argued that the connectivism theory did not explain the learning process. However, Siemens suggested that processing information is a result of actionable learning. Some knowledge rapidly changes and forces teachers to develop new learning methods. Then, teachers help students to reach curriculum learning goals by guiding them through the rapidly changing information. Sanusi et al. (2020) gathered research data for their quantitative study to explore changes in education through the lens of connectivism theory. The authors stated that the valuable lens of the theory provided a better understanding of teaching and learning. Ramkissoon et al. (2020) used connectivism in their mixed methods research for thematic content analysis and structured details regarding participants' perceptions. Ramkissoon et al. stated that the connectivism theory helped researchers and teachers conclude that the e-learning platform should meet the requirements and expectations of the students. Researchers used Siemens' connectivism to look for ways to evaluate student performance in virtual settings.

How This Study Benefits From Siemens' Connectivism

Siemens's (2005) connectivism theory raises the awareness that learning can occur outside the person through technology. Online education is accessible, and it is constantly updated. Constant connection to technology enhances the learning process. Now, learning is available in various ways and is a lifetime process. Learning is experience, and interaction using activities can constantly affect change in human performance. The connectivism theory provided an innovative lens supporting the research question and analysis of how teachers recognized the importance of implementing kinesthetic and tactile learning during COVID-19. The proper context and content have to connect to the right students and information flow. Also, connectivism through social networks allows a student's knowledge to help others learn and remain current. Connectivism recognizes how the shifts in society affect educational learning platforms.

Developing new methods for information processing could be disruptive to education. Educators should revise teaching styles to meet children's learning preferences in the digital age. The theory of connectivism guided researchers Hariri et al. (2023) in their survey of selected students in London universities during the COVID-19 pandemic, focusing on technology and societal change. Technology changed what, where, and how to learn (Western Governors University, 2021). Siemen's connectivism theory encourages students to stay connected to technology because knowledge constantly changes (Hariri et al., 2023). Learning can occur outside of the teachers, such as through online networks. To do this, the instructors motivate students with opportunities to create

their own experiences to learn in virtual settings, for example introducing interactive software or a learning video on YouTube (Western Governors University, 2021). Connectivism involves learning by making continual connections through networking. Therefore, the use of technology in education for primary students consists of teachers making choices of software and learning activities in virtual settings.

Siemens's (2005) connectivism applies a contextual lens of teachers' experience with kinesthetic and tactile learning. The theory can support literacy, mathematics, and computer coding to help primary students increase learning engagement. Children who are coders achieve high-order thinking skills, problem-solving skills, critical thinking abilities, and basic numerical and shape concepts. Connectivism benefits this study's research questions and analysis. Students should learn to obtain knowledge from kinesthetic and tactile activities and implement what they learned. Addressing new learning challenges is essential for the digital era. Segments of Siemens' theories make up the combined conceptual framework.

Writings by Key Theorists Related to the Study's Conceptual Framework

Dewey (1938, 2009) was the primary theorist of constructivism. Following Dewey, other theorists of constructivism and education added new perspectives to constructivism. Bruner and Bruner (1990) argued that learning is an active process of forming new ideas by adding current and past knowledge. Piaget and Inhelder's (1969) ideas on cognitive development stated that experience produces knowledge.

Dewey's (1938, 2009) pragmatic constructivism theory and Siemens's (2005) connectivism theory support the conceptual framework as a structure emphasizing active

learning that concerns the holistic student and uses movement to process information. Each theorist contributed a new way of doing things for students to learn in virtual settings. Vygotsky's (2016) learning theories of constructivism connect with Dewey's theories with suggestions that people learn through a hands-on approach, from the experiences of the world, and through reflection on those experiences. Magana (2017) used Dewey's theory to support disruptive technology and 21st-century learning, which consists of new ways for students to achieve learning goals. Siemens (2005) built his connectivism theory upon Dewey's philosophy of continuity and interaction (Cerny, 2020). Siemens pursued an understanding of learning in the digital age. He based active learning and decisions upon the altering learning foundation. In the changing times of disrupted education during the COVID-19 pandemic, the traditional classroom was put on hold to transition to virtual studies to support disruptive learning. Learning should not be restricted to the traditional classroom or one instructor but come from diverse opinions (Cerny, 2020). It is an opportunity to engage in self-regulating learning.

Dewey (1938, 2009) criticized educators for treating students separately from their environment (Cerny, 2020). Siemens's (2005) ideas received attention and debate for supporting learning preferences and discovery in the digital world. Siemens' theories also lacked the retesting and revision of other learning theories derived from definitive frameworks (Corbett & Spinello, 2020). Vygotsky (2016) created learning theories for children. His untimely death left many of his questions that are still unanswered. The outdated and limitations of his work continued to be a consideration for all research disciplines (Vasileva & Balyasnikova, 2019). Arora and Chander (2020) stated that

Magana's T3 framework was comparable to digital technology theories such as technological, pedagogical, and content knowledge (TPACK) and Substitution, Augmentation, Modification, and Redefinition (SAMR) because it provided standards for teachers to improve their current knowledge of technology integration. Dewey's learning theories continue through the views of theorists framing online learning.

Literature Review Related to Key Concepts

The scope of my qualitative research was to engage in understanding and reporting on primary teachers' experiences with kinesthetic and tactile learning in virtual settings. The literature review is a synthesis of peer-reviewed research articles that explore kinesthetic and tactile learning and their applications to educational topics such as math, literacy and social skills. I will describe the ways researchers in the discipline approached the problem and the strengths and weaknesses inherent in their approaches. My study explores what is known, controversial, and unknown on the topic. I will provide a synthesis of research articles as evidence supporting the interview questions and the meaningfulness of the study. The literature review addresses primary education through college to provide rich information for answering the research question.

The literature review consists of five themes. The first theme, learning with motion for primary students, introduces the kinesthetic and tactile learner and teaching aids. The second theme, strengthening learning with kinesthetic and tactile activities, focuses on research articles about increasing student learning with movement. The third theme, virtual settings, mentions primary learning is holistic and that virtual settings include learning activities.

During the COVID-19 pandemic, teachers transitioned learning activities to virtual settings. Schools also hired teachers during the pandemic, who implemented kinesthetic and tactile activities in virtual settings. The fourth theme, teachers transitioned kinesthetic and tactile activities in virtual settings, describes the rationale for continuous learning with activities. The fifth theme, teachers implemented kinesthetic and tactile activities virtual setting, includes a discussion of what is known, not known, and remains to be studied about my research topic. The literature review ends with peer-reviewed articles on understanding teachers' experiences with kinesthetic and tactile activities in virtual settings.

Learning With Motion for Primary Students

This section contains a description of studies related to the constructs of interest and chosen methodology and methods consistent with the study's scope. Kinesthetic and tactile activities strengthen students who have challenges processing information through auditory and visual learning. Teachers use multisensory kinesthetic and tactile modalities to motivate knowledge transfer and student learning engagement (Schukraft, 2020; Spezini, 2021; Stamm et al., 2021). Gardner's multiple intelligences theory suggests eight types of intelligence exist. Gardner's theory recognizes kinesthetic and tactile as one of the multiple intelligences (Gardner, 2006; Indrawati, 2021). The different types of intelligence are equally important abilities, supporting children in the early developmental stages of learning (Sarouphim, 2021). Gardner (2006) suggested a person can rely on one intelligence more effectively than another to solve real world problems, for example, a student can have a strong physical kinesthetic intelligence rather than a

strong linguistic intelligence. According to Spezini (2021), the visual, audio, kinesthetic, and tactile (VAKT) system includes kinesthetic and tactile as part of the modalities to teach content, known as multisensory learning.

Multisensory learning instructors include multisensory activities to teach with all modalities for student learning and engagement. The instructors model kinesthetic and tactic activities in virtual settings while asking students to use whole physical movement to support student engagement and new knowledge (Spezini, 2021). It is challenging to equally use all learning types in virtual settings to teach content (Tvaltvadze & Gvelesiani, 2021). The kinesthetic and tactile learners would want more physical active learning than their classmates.

The Kinesthetic and Tactile Learner

Kinesthetic and tactile activities help students who need more than visual and auditory learning activities (Bøg et al., 2021; Perdaniama, 2021; Sarouphim, 2021). According to Al Adzillina and Hasanah (2021), kinesthetic refers to active learning through movement and tactile refers to learning through touch. Stamm et al. (2021) described kinesthetic learning as using hands-on experience and performing tasks to process information. Physical hand movements encourage student engagement by initiating learning from gestures. Kinesthetic learners prefer to experience the learning material. Yuniarsih and Alifah (2021) stated that every student has a preferential learning process, and teachers should know their students' learning preferences. The researchers used correlational research to determine sensory priorities for students. The authors concluded that students obtained better outcomes when they learned with kinesthetic,

tactile, auditory, and visual senses. They found that 22% of student participants were kinesthetic learners.

Teaching Aids

Primary teachers use kinesthetic and tactile teaching aids such as playdough and sand writing to ensure their learning experience positively impacts learning how to read (Rostan et al., 2021). The teaching aids in the classroom are similar to the use of teaching aids or materials supporting virtual settings, and both types of teaching aids require the instructor to innovate learning (Munajah et al. (2022). The authors of both studies concluded that learning activities assisted in improving reading and social skills. The studies described how kinesthetic and tactile learning involved teachers' preparedness in applying learning activities to help students reach their learning objectives. Al Adzillina and Hasanah (2021) took pre-test and post-test measurements during in person learning with one of the researchers as an active participant to demonstrate that students aged five to six increased learning by using multisensory activities, especially if that was their individually preferred learning style. The authors described kinesthetic as moving and tactile as touching. Learning activities were rearranging letters and words to form sentences, learning sounds with letter cards. According to Al Adzillina and Hasanah (2021), class management ensured that teaching and learning ran smoothly, and improved when instructors learned each students' name.

Hariri et al. (2023) conducted descriptive research with university students completing questionnaires to investigate student's challenges in virtual settings during the COVID-19 pandemic. The authors concluded that students should learn in a caring

virtual setting, for example, through short videos, implementing teaching styles according to learning styles, and posting recorded classes. Fiş Erümit (2021) concluded from a K-12 student survey that the students enjoyed activities during the lesson breaks, such as exercising, drawing, story time in the virtual settings. They enjoyed teachers providing multiple ways to communicate their curriculum. The author also indicated that synchronous lessons were motivating and provided a space for social interaction. These authors claimed that the implementation of kinesthetic and tactile activities or learning activities would be helpful to students at all grade levels, all contexts, and learning abilities. Misirli and Ergulec (2021) performed mixed method research to study 983 parents of students in primary and secondary learning who experienced emergency learning in virtual settings during COVID-19. In this study, teachers offered mostly online core classes that required self-learning rather than courses offering sports and music for kinesthetic learning and growth in social skills. Core classes are the strength of education. These studies indicated that teaching and learning in virtual settings should include students' unique learning styles with learning activities and teaching aids to reach the class learning goals.

Processing and Comprehending Information

Kinesthetic and tactile activities benefit growth in academic and social skills when teachers present information through movement to help students process and learn information (Bøg et al., 2021; Perdaniama, 2021; Sarouphim, 2021). Most primary students are active learners, and they learn through activities. Hakim et al. (2021) performed qualitative action research indicating that playing with different puzzles

improved students' intelligence. Indrawati (2021) indicated, after a systematic review of articles, that the mind and body have the potential to be creative and solve problems with kinesthetic activities. Learning through trial and error helped students remember the procedures or steps to solve problems. The movement of puzzle pieces allowed students to feel and see the evidence of what they were learning.

Kinesthetic and tactile learning involves repetitive activities to improve memory (Spezini, 2021). If teachers accommodated student learning styles, the kinesthetic and tactile activities would improve learning due to students' physical involvement in processing information (Ameer & Parveen, 2023). Their participation in increasing students' learning activities that results in positive experiences could evolve into innovations that will enhance future learning. Kinesthetic and tactile learning allow students to improve social skills and confidence in learning individually and with other students because they could share problem-solving processes (Almasri, 2022).Teachers enhanced the growth in social skills by sharing, which brought students together to bond during learning and after-school activities. These studies depended on how teachers motivated students to participate in active learning.

Strengthening Learning With Kinesthetic and Tactile Activities

In this section, I will review current literature and describe how researchers in the discipline have approached the problem and the strengths and weaknesses inherent in their approaches. Researchers approached this study's problem statement through qualitative and quantitative research, with teachers, principals, and students as participants (Culp et al., 2020; Rostan et al., 2021). However, very few researchers in the

discipline explored the challenges with implementing primary kinesthetic and tactile activities in virtual settings.

Before the COVID-19 pandemic, Magen-Nagar and Firstater (2019) discovered that many teachers never used the full potential of technology in their primary classes. Meda and Mohebi (2021) stated that during the COVID-19 pandemic, education in virtual settings caused teachers to incorporate less kinesthetic activities such as physical play. Educators instructing with less active learning made it difficult for students to process information. Magen-Nagar and Firstater (2019) reported that although teachers were aware of the advantages of information communications technology (ICT), they thought ICT would delay students' social development, especially those with special needs. Accessing the full potential of technology includes the use of video conferencing software. For example, Elisavet (2021) concluded that many primary teachers have not commonly used break-out rooms for preschool and kindergarteners. The inherent strength from the author's narrative inquiry provided knowledge by focusing on participants' lived experiences through shared stories.

The inherent strength of these qualitative studies was the researchers' instrumentation, semistructured interviews and questionnaires. The interviewer had the opportunity to ask primary teachers to share in-depth information that could introduce context and innovation. Magen-Nagar and Firstater (2019) also applied inherent qualitative analysis using open, axial, and selective coding for emergent themes from the data. Open coding is also known as initial coding resulting in various emerging data (Saldaña, 2021). The researchers increased worthiness and reduced bias by each

researcher conducting an independent content analysis. COVID-19 pandemic school closures forced teachers to increase their use of virtual settings (Albeta et al., 2021; Meda & Mohebi, 2021; Stamm et al., 2021). Bartnæs and Myrstad (2022) stated that instructors should explore the inherent opportunities in unprecedented times. These opportunities could aid in pushing education beyond traditional practices. The researchers concluded that faced with the possibility of weakened teaching outcomes, participants should change their instruction and assist in creating new active learning strategies in virtual settings.

Some researchers approached the problem statement using quantitative and mixed methods (Aljaberi, 2021; Tobin et al., 2021; Wang et al., 2021). A quantitative study by Wang et al. (2021) concluded that most children use digital technology under their parental supervision. Before COVID-19, researchers indicated that the Apple Store had more than 180,000 children's education apps, with 68% of children under eight years old using apps. Aljaberi (2021) declared that electronic gaming has kinesthetic activities enriching children's higher-order thinking skills. However, students in the study's controlled and experimental groups preferred books and storytelling more than digital technology. These authors showed that kinesthetic and tactile activities and digital technology were still evolving in the primary classroom pre-COVID pandemic. Inherently, kinesthetic and tactile activities take children's information processing beyond lectures. The implications, limitations, and future directions are inherent to research. These researchers indicated how the findings of their studies might be important

to education policy. The results might move new online learning activities forward to benefit the future curriculum.

Wang et al.'s (2021) study introduced students to the latest technology, such as the iPad. The study showed that children's learning to tell time increased by using apps with interactive software designed for tactile gestures. Wang et al. (2021) concluded that student participants learned better at home or school instead of in the laboratory setting arranged for the study. The laboratory setting seemed to weaken the study. Kinesthetic activities seemed beyond reach during the emergency move to virtual settings due to a lack of online training and average limited infrastructure (Karcher et al., 2022). The challenge of including hands-on activities in virtual settings is the start of creative adjustments to continue learning engagement for kinesthetic learners.

The Learning and Comprehension With Motion

Researchers used teacher and student perceptions and perspectives to approach the problem statement (Akojie et al., 2022; Bird, 2020; Karcher et al., 2022; Liu et al., 2021; Meletiou-Mavrotheris et al., 2023). Children start to read and write in kindergarten. Their teacher impacts how they learn. Primary students keep a good level of attention by reading picture books and using a tablet with educational games (Liu et al., 2021). These researchers suggested that teachers should consider age, settings, and student development level before implementing learning in virtual settings. Some teachers quickly transitioned to virtual settings by sharing curricula and procedures (Akojie et al., 2022). The study's participants, K-12 teachers, implemented kinesthetic and tactile activities during online distance learning. Teachers turned to the availability of learning

software on the internet. Meletiou-Mavrotheris et al.(2023) conducted a survey on teacher's perspectives of the sudden transition to virtual settings. The author reported that teachers continued to use software applications such as Seesaw, edPuzzle, and Pear Deck for learning engagement when they returned to in person learning. Opportunities emerged to interact with students during a time of emergency, and to implement technology for innovative learning. The researchers concluded that disrupted learning caused an inevitable change; and educators should embrace opportunities for that change.

Inherently, in the role of researcher, the researcher chooses the instrumentation. Liu et al. (2021) determined an educational game app did not record an operation log response time, and the software needed a "next" button. The primary class needed simple software commands. The researchers could validate data more effectively from the software operational logs. Akojie et al. (2022) sought the opportunity to strengthen their study through the limitations. They stated that the duration of the study was three months from the start of the COVID-19 pandemic. The researchers captured a critical moment in history by understanding teachers' perceptions during a single point in time. The researchers used limitations to inform the readers of changes in interview techniques because they changed from face-to-face to online. Both researchers mentioned kinesthetic activities in their studies. However, they did not include teachers' experiences describing active learning challenges in virtual settings.

Uniquely Holistic

Primary learning activities should be holistic with play-based activities. The curriculum was holistic, where learning included students' physical, emotional, and cognitive needs (Bautista et al., 2021; Brifkani, 2021; Wrathall, 2021). Kindergarten teachers provide a core learning curriculum with fundamental knowledge before students entered elementary school (Bautista et al., 2021). Children used play to imagine using digital devices, such as cell phones, and they usually watch adults value and use their electronic devices (Bird, 2020). For example, a child might use a comb to represent a cell phone, which motivates the use of imaginative technology during play. The inherent strength of these qualitative studies was the conceptual framework supporting imaginative technologies as active learning. Today, children are growing up with the increase in use of technology for learning and play; however, more studies are needed to show how electronic devices support learning and play (Bird, 2020). Touchscreen technology allowed primary students to use their fingers on the screen as a writing pad (Yadav et al., 2023). The iPad design supported the primary students' developing motor skills. Future studies should include how imagination can create ideas for digital technology and ethical behavior.

Blended learning can ensure holistic education for the kindergarten curriculum (Wilkes et al., 2020). During COVID-19, some schools implemented blended learning to reserve more physical space in the classroom for social distancing. Teachers using blended learning in kindergarten helped students increase literacy skills and provided a flexible model fitting the pedagogy approach (Wilkes et al., 2020). The blended learning

study inherently supported active learning by allowing teachers to use virtual settings and in person learning. Tobin et al. (2021) used mixed-method research using teachers' experiences in 3-D science for elementary students during COVID-19. In their results, the researchers supported suggestions to make virtual settings permanent for future learning. Inherent to the interview process, teachers' experiences provided in-depth information because they were on the cutting edge of the phenomenon. Teachers' challenges in these studies were the decline of kinesthetic and tactile activities in virtual settings, students working less in small groups, and fewer school supply deliveries. Inherently, disrupted learning permanently changes instructors teaching practices.

Thrive in Academic and Social Skills

Primary students thrive in information processing when teachers apply kinesthetic and tactile activities (ArgoPrep, n.d.; Cerezci, 2021; Rostan et al., 2021; Schraeder et al., 2021; Suryaningsih et al., 2021). Reading is the most challenging course offered early to elementary students, and some students begin school with the possibility of being diagnosed with dyslexia (Schraeder et al., 2021). The addition of kinesthetic activity introduces the capability of controlling physical movements to increase learning (Suryaningsih et al., 2021). Dance increases muscle flexibility. Increased flexibility is associated with enthusiasm which helps children start their thinking abilities. Effective teaching with multisensory consisting of kinesthetic and tactile activities improves learning and memory (Schraeder et al., 2021). School principals should effectively intervene in the reading programs by adding active learning that supports all students, including students with dyslexia. Children learn uniquely during physical and mental

development. Students can thrive academically and socially when educational leadership adds an effective curriculum and technology that focus on students' needs. Learning for young children is multisensory. It includes visual, auditory, kinesthetic and tactile activities.

Instructors introducing the correct motor skills for early learners contribute to children's growth. Teachers can improve students' academic performance using learning activities, such as dance (Suryaningsih et al., 2021). Some young learners have dyslexia (Schraeder et al. (2021), and phonic learning programs with kinesthetics movements can improve education for these students. Increased flexibility is associated with enthusiasm which helps children start their thinking abilities. For example, students begin to memorize physical movements. Hands and feet coordinate with memorization to help students remember. The researchers indicated that through dance, social skills developed. School principals sponsored school plays and music performances to motivate student learning and development. The strengths were the implications and recommendations that future research should include studies on principal leadership and student outcomes. Overall, the studies indicated that kinesthetic and tactile activities are essential for thriving holistic learning.

Virtual Settings

This section contains a justification from researchers in the literature and a rationale for the selection of concepts. My selection of concepts is related to understanding the teachers' experiences with kinesthetic and tactile learning in virtual settings (Albeta et al., 2021; Bartnæs & Myrstad, 2022; Meda & Mohebi, 2021;

Nikolopoulou, 2022; Stamm et al., 2021; Tobin et al., 2021). The literature supporting my rationale for exploring kinesthetic and tactile learning in virtual settings included the UNESCO (2020) guidelines. The COVID-19 pandemic caused school closures. In response to mandated school closures, UNESCO (2020) provided guidelines for online teaching (Nikolopoulou, 2022). The guidelines included multisensory learning in virtual settings comparable to traditional learning. I selected concepts from research articles to describe my study. Learning in virtual settings can consist of using software involving hands-on experiences or tactile activities to process information (Nikolopoulou, 2022). Instead of listening or watching, kinesthetic learning is by doing, which is beneficial for students who prefer movement over listening or watching.

Since the COVID-19 pandemic, the concept of teaching and learning in virtual settings has become crucial in education due to social distancing guidelines and the continuation of the new variants (Tobin et al., 2021). The COVID-19 pandemic disrupted learning causing school closures with teachers urgently transitioning to virtual settings. They were challenged to maintain student engagement and confidence in learning comprehension (Stamm et al., 2021). The review of the literature justifies the selection of my concepts in several ways. Virtual settings are synonymous with online distance learning, e-learning, and blended learning. The concepts are meaningful to all levels of learning. The COVID-19 pandemic school closure mandates forced teachers to pivot teaching and learning in virtual settings. A pressing issue was how to deliver content best to facilitate learning for students in the virtual settings.

Students have different learning preferences. Teaching and learning involve knowing how students process and remember information (Hermini et al., 2021; Perdaniama, 2021; Spezini, 2021; Stamm et al., 2021). Hermini et al. (2021) stated that it is good to know the students' learning preferences. The researchers aimed to study the various high school student learning preferences and asked them about online learning. They discovered that 78 percent of high school visual learners did not like learning in virtual settings because they did not understand the instructions. Also, he noted that students who study individually might not want to study together due to their learning preferences. The researcher defined kinesthetic activities as learning by living and feeling to process information.

The rationale for learning math, literacy, and social skills aligns with 21st-century skills. Content starts at the primary level and continues through college (Albeta et al., 2021; Aljaberi, 2021; Mabrouk, 2021). Primary teachers should not limit students to traditional learning while knowing that real-world learning changes might include virtual settings in most subject areas. Online learning affected learning activities significantly, even for students attending college. The chemistry students at three universities in Indonesia enjoyed kinesthetic learning in virtual settings (Albeta et al., 2021). According to Mabrouk (2021), teachers should note that students learn naturally by touching, reaching out, and experiencing by hand. Dewey opened the doors to the outside, and today, more educators are opening the doors to virtual settings with kinesthetics. The literature indicates a gap in kinesthetic and tactile learning that addresses primary

students learning in virtual settings. Results from the literature review justify the study's gap and support the rationale for selecting concepts.

Teachers Transition Kinesthetic and Tactile Activities to Virtual Settings

This section contains a review of the key concepts under investigation with synthesized studies to produce what is known, what is controversial, and what remains to be studied. Little literature exists about primary teacher experiences with implementing kinesthetic learning and teaching in virtual settings (Albeta et al., 2021; McKenna et al., 2021; Meda & Mohebi, 2021; Nikolopoulou, 2022; Stamm et al., 2021).

Kinesthetic learners apply to students who best learn from physical movement. I selected the concept "teacher experience" to identify and recruit teachers who implemented kinesthetic and tactile innovation in virtual settings. Kinesthetic and tactile learning is just as natural as other learning preferences (Indrawati, 2021). Girón-García and Gargallo-Camarillas (2020) suggested that what is not known is how the available multimodal technology designed to accommodate digital learning activities will relate to students' learning styles. Korres et al. (2021) concluded that it is not known how haptic stimulation, which is a form of tactile feedback, can provide feedback for students learning how to write.

What is controversial is that some educators still rely on traditional learning activities with concrete materials such as toys or blocks during the COVID-19 pandemic. Quigley's (2021) qualitative research with semistructured questions indicated that 94% of participants stated that concrete materials enhanced learning engagement. It is difficult for students to understand without them, which conflicts with a low number of

respondents who believe that concrete materials are not essential to active learning. Polyzou et al. (2022) concluded that after interviewing five and six-year-old participants, augmented reality (AR) books are not ready for use for the intended students. Children preferred the traditional paper interactive books. What remains to be studied is how AR and interactive books offer kinesthetic activities for learning engagement. Primary teachers are to include digital technology for learning math, reading, and literacy; however, children's motor skills needed more development for screen control. Teachers' beliefs impact their choices of the types of learning activities for students. Further studies focusing on teacher beliefs might help educators learn what might influence teaching in virtual settings.

Teachers Implement Kinesthetic and Tactile Activities in Virtual Settings

This section contains a review and synthesized studies related to the research question and why the approach selected is meaningful. The main research question for this study concerns the primary teachers' experiences with implementing kinesthetic and tactile learning in virtual settings. Recent studies relate to my research question because the pivot to virtual settings due to COVID-19 affected education worldwide. The paucity of information caused the need to add knowledge to the discipline to improve future learning for primary students. According to Burkholder et al. (2016), the basic qualitative selected approach is meaningful by filling literature gaps with knowledge and experience from primary teachers' in-depth interviews. Quantitative studies focus on results with numbers and do not provide participants' knowledge and experiences with in-depth information.

Experiences With Physical Movement to Learn in the Virtual Settings

During the pandemic COVID-19, Jimola and Ofodu (2021) indicated that the participants did not prefer a learning style or preference, which was a conclusion from their survey approach to explore if the educational learning channels in Nigeria, such as digital technology, radio, or television, included learning preferences. Farrell and Stanclik (2021) used a different approach, a qualitative case study exploring the challenges of how one teacher moved from in person learning to virtual studies. Their results showed that the participant provided many kinesthetic activities in the classroom but was forced to rethink lesson plans and adaptability for delivering lessons in an online platform not designed to allow much physical movement. The teacher could not read body language anymore, especially if students turned their cameras off. Both studies consisted of a qualitative approach to understanding teacher experiences in virtual settings. Their samples differed from an extensive survey sampling to one participant. Still, they got meaningful results from the participants' responses to the interview questions.

Siemens' connectivism theory was a meaningful framework approach for Jimola and Ofodu's (2021) study because the theory related to the education changes caused by the COVID-19 pandemic. Dewey's framework in the case study indicated that his theory could support the inquiry with the researcher's reflective memos. Their studies relate to my research question from the lenses of Dewey's active learning theory and Siemens' connectivism to continue learning activities that improve information processing in the changing curriculum. The researchers used Siemens' connectivism theory to characterize the use of the software, which is meaningful to my study because the combined

conceptual framework includes characterizing the use of virtual settings for future improvement. Farrell and Stanclik applied member checking and validity (Lincoln & Guba, 1985) were meaningful example validity approaches to this study to increase this study's trustworthiness.

Kinesthetic and tactile activities in virtual settings caught the attention of designers and researchers who used qualitative research to explore and capture educational innovation in the discipline. Kart (2021) introduced a teaching tool called Visual Phonics. This teaching tool helps the deaf or hard-of-hearing students apply kinesthetic movement to successfully learn phonics by clarifying letter sounds with spoken and written words. Osgood and Bressan (2021) explored storytelling with electronics and concluded that storytelling is best when told with hands-on activities for kinesthetic learners. Spezini (2021) taught phonology with traditional kinesthetic activities. The author stated that teachers redesigned the phonology curriculum to asynchronous online kinesthetic activities. The authors proved my concepts were meaningful by indicating that research should provide more studies to explore kinesthetic innovations in virtual settings.

Furthermore, the researchers mentioned in this section explored learning in virtual settings through educators' experiences, making my research approach meaningful. They presented a channel to add rich knowledge to the field from teacher experiences. The approach selected was meaningful due to its conceptual framework consisting of the same theorists used in this study. The best answers to the research question require understanding teacher experiences with kinesthetic activities during the COVID-19

pandemic. Teachers had to quickly transition kinesthetic learning to virtual settings. Their urgency included challenges and creativity.

Tactile Activities

Tactile activities refer to students learning more effectively by touching. Touching helps them visualize real-world projects. Kinesthetic learners prefer combining tactile activities more than visual and auditory (Ameer & Parveen, 2023); however, students experience fewer hands-on activities in virtual settings. Motor movement and tactile senses increase students learning and comprehension. Learning in virtual settings can include flexible tactile activities to improve learning and remembering (Jimola & Ofodu, 2021). For example, flexibility in virtual settings with learning activities can be a combination tactile and visual activities while sharing videos and artwork. Moreover, the virtual settings should consist of a variety of learning platforms and digital media such as YouTube (Jimola & Ofodu, 2021). A modification to learning activities is having access to various software applications for educators and students if an emergency should occur. Quizlet, learning with digital cards, and Zoom presentations were two readily learning software apps available for tactile activities (Jimola & Ofodu, 2021). Motor movement and tactile senses could increase students learning and comprehension.

Furthermore, haptic is a touch feedback tactile activity created on electronic devices. Haptic is also a handshake that allows feedback through touching. Cesari et al. (2021) argued that during COVID-19, online synchronous learning was a sensible alternative to in person learning because it allowed immediate feedback. Multisensory stimulation can occur in virtual reality (VR), augmented reality (AR) or mixed reality

(MR). Haptic (touch) uses an artificial environment to interact deeply with the real world. This learning environment provides an alternative for education with near-realistic three-dimensional scenarios. The VR/AR devices allow students to engage by using multiple and personalized learning activities and enhance social presence through avatars. VR experiences include museum visits and rock climbing. Jewitt et al. (2021) stated that touch was the qualitative researcher's most neglected learning activity. Although touch is central to human experience and interaction, the research methodology for touch is emergent content but challenging due to the difficulty in describing and observing touch experiences and sensory interviews.

The qualitative approaches are meaningful to my study because they use interviews to address participants' experiences related to kinesthetic and tactile learning activities, technology, and encouraging learning engagement for the primary students. Their approaches consisted of obtaining in-depth information from experiences to add knowledge to learning activities in virtual settings. These studies suggested that the key concepts under investigation are part of the changes and creativeness to improve learning activities during the COVID-19 pandemic.

Summary and Conclusions

This literature review resulted in five emergent themes for primary teachers' experiences with innovative kinesthetic and tactile learning in virtual settings. There is research on learning activities, but little is on the use of kinesthetic and tactile learning in virtual settings for primary students. The conceptual framework consisted of two major emergent themes from the literature review, *Active learning and learning through*

connectivism. The conceptual themes were a combination of two theories, Dewey's (1938, 2009) pragmatic constructivism theory and Siemens's (2005) connectivism theory. The theorists' views support active learning, and the essential learning of play in virtual settings. A learning transaction occurs through interaction with the curriculum and cultural awareness. The removal of learning limitations will help students thrive. The curriculum constantly changes due to unprecedented societal events. The literature review consisted of five emergent themes:

- *Learning With Motion for Primary Students*

  Active learning helps primary students learn and remember. Tactile activities include teaching aids for the kinesthetic and tactile learner, such as touch feedback helping students improve reading and writing skills.

- *Strengthening Learning With Kinesthetic and Tactile Activities*

  The unique holistic curriculum includes students' physical, emotional, and cognitive needs. The kinesthetic and tactile learners thrive in academic and social skills while using active learning. Teachers use teaching aids to improve the student learning experience.

- *Virtual Settings*

  UNESCO (2020) created a teacher guide for using virtual settings. Flexibility encourages enthusiasm. Students improve their thinking abilities through physical movement.

- *Teachers Transition Kinesthetic and Tactile Activities to Virtual Settings*

During COVID-19, teachers created learning activities, encouraged student engagement, and knowledge transfer. There is little literature on their experiences with implementing learning with motion in the virtual settings

- *Teachers Implement Kinesthetic and Tactile Activities to Virtual Settings*

  Teachers pivoted their curriculums to virtual settings and included kinesthetic and tactile activities while tactile activities were still an emerging content. The move affected schools worldwide.

I created these themes in this study's the literature review from relevant peer-reviewed articles less than five years old. A summary of what is known as well as what is not known in the discipline related to the topic of study is a result of the literature review. What is known is that although tactile (touch) is a central human experience, research in haptic technology is challenging due to participants' difficulty describing the sensory during in-depth interviews (Jewitt et al., 2021; Korres et al., 2021). What is not known is the availability of digital technology designed to accommodate individual learning activities (Girón-García & Gargallo-Camarillas, 2020). What is controversial is that many educators still rely on traditional kinesthetic and tactile learning activities with concrete materials such as toys or blocks (Quigley, 2021). For some educators, concrete materials are not essential to active learning (Quigley, 2021). The gap in the literature is the lack of research concerning primary teachers' experience of implementing innovative kinesthetic and tactile learning in virtual settings.

In Chapter 3, I will describe the research method, this study's participant sampling, and the interview protocol considered to provide in-depth information that

could fill the gap in the literature. The chapters will include a rationale for the chosen research tradition. I will explain my role as the researcher and include any ethical issues applicable to the study with plans for addressing the issues.

Chapter 3: Research Method

The purpose of this qualitative study was to explore primary teacher experiences with implementing innovative kinesthetic and tactile learning in virtual settings. Exploring kinesthetic and tactile learning in virtual settings for primary grades might increase an understanding about improving future kinesthetic learning activities for primary students. The experience of the participants provided in-depth information that increases understanding of kinesthetic and tactile activities for primary students. More discoveries about kinesthetic and tactile learning could create positive social change by informing early education or primary teachers of the various instructional choices available to help information processing and comprehension. The research findings might increase teachers' self-efficacy in identifying learning preferences that motivate continual learning.

In Chapter 3, I will discuss the research design and rationale. I describe my role as the researcher to address any biases that might affect the study. Moreover, I reveal the methodology, including participant recruitment and selection. I explain the instrumentation, data collection, and data analysis plan. Lastly, I state the ethical procedures and descriptions of preserving and increasing trustworthiness issues to establish the content validity of this qualitative study.

Research Design and Rationale

The research question guiding this basic qualitative research was: What are primary teacher experiences with implementing kinesthetic and tactile learning in virtual settings? The underlying philosophy is described as constructivism and connectivism.

Constructivism states that learners construct knowledge (Dewey, 1938, 2009), while connectivism takes active learning into the virtual setting platform (Siemens, 2005).

The research tradition was a basic qualitative approach. I formulated the main research question to gain knowledge and in-depth understanding from primary teacher experiences with implementing kinesthetic and tactile learning in virtual settings. The basic qualitative study focused on purposeful sampling to collect rich descriptions resulting in understanding and obtaining the meaning of experiences (Merriam & Tisdell, 2016). I explored primary teachers' experiences to answer the research question, supporting the research design appropriate for the qualitative study. I interviewed the participants through a semistructured interview process.

The rationale for choosing the basic qualitative tradition was to describe a phenomenon that occurred in the world. The design consisted of semistructured interviews to focus on participants' detailed descriptions that contributed to knowledge and in-depth understanding of the phenomenon. I incorporated the participants' voices. According to Merriam and Tisdell (2016), semistructured interviews contain the flexibility of having mixed or structured interviews. I chose semistructured interviews to explore multiple perspectives of experiences portraying ongoing learning in virtual settings. Individual interviews provided the richest information. I conducted online synchronous interviews to save time (Merriam & Tisdell, 2016). Data saturation occurs when the data collection no longer reveals new themes or patterns (Burkholder et al., 2016; Lincoln & Guba, 1985). The interviews aligned with the research question, including the opportunity to explore what did not occur or could not be seen. The basic

qualitative approach was appropriate for seeking the experiences of a small number of primary teachers. The data collected were sufficient to answer the research question (Burkholder et al., 2016). The approach was inherent in seeking in-depth descriptions from the participants.

Role of the Researcher

As the researcher, my responsibility was to serve as the primary instrument of the study. The researcher ensures that a clear, honest picture of the phenomenon emerges from the study (Lincoln & Guba, 1985; Patton, 2014). The researcher also centralizes the complexity of the shared discourse by the participants (Patton, 2014). From the beginning of the study, I formulated the research question and made decisions on sampling. As the researcher, I was the central contributor throughout all phases of data collection, such as researcher memos, interviews, coding, results, and analysis. While serving as the primary instrument, my role was to ensure the study's alignment and obtain a deep exploratory understanding of the research.

During the data collection process, my role as the researcher was to conduct semistructured interviews and observe participants. I established a rapport to communicate with the participants throughout the data collection process during in-depth interviews. (Babbie, 2017). I did not have any prior personal or professional relationships with the participants, including any supervisory or instructor relationships involving power differential. I ensured a reverent naturalist setting for the interviewee. According to Rubin and Rubin (2012), the naturalist is an interviewer who seeks understanding

without predicting the answers. Natural settings are best for obtaining participants' experiences.

My responsibility in the study was to ensure that I remained unbiased. I had no research biases for this study. To fulfill this responsibility, my positionality writings consisting of researcher memos reminded me of my role as a researcher, which was to support the research as a moral priority. The research memos kept me mindful of reflexivity, positionality, and bias. The researcher memos consisted of recorded and written notes that distinguished the researcher's experience and interpretation of events. It included behaviors, activities, and people's roles (Ravitch & Carl, 2016). The reflexivity was a reminder of how my role as the central contributor can add rigor to all study phases (Ravitch & Carl, 2016). My research memos continued through the study's data collection and saturation. I recorded or wrote them as soon as possible after each interview.

Unique Ethical Challenges of Protecting Privacy

As the researcher, my responsibility was to protect privacy, which included confidentiality and anonymity. According to Ravitch and Carl (2016), confidentiality relates to protecting privacy and providing decisions on disseminating the related data. Anonymity consisted of keeping the participants' identification private. Kimmel (2011) suggested using only the required data. For non-disclosure, the researcher should use pseudonyms for participants. For this study, identification numbers replaced all names and addresses. Therefore, I created a confidential identification file with cross-references for the participants and their schools.

Minimizing Harm

Research participants should never experience harm when volunteering in the study (Kimmel, 2011). Harm includes emotional or psychological distress and physical injury (Babbie, 2017). Participants signed an informed consent form indicating they were aware of and fully understood the risks involved and will still choose to participate. The concept of informed consent for voluntary participation was a formalized ethical process for respondents. The respondents understood that their participation was voluntary in the research project.

Respecting the Shared Experience of Others

Data collection was as overt as possible with recorded findings (Kimmel, 2011). I relied on reflexivity to identify my experiences and set them aside using researcher memos to remind me that the participants' experiences were at the center of the phenomena. It was unethical not to explore my biases or influence the interviewees with misleading statements.

A relational approach with reflexivity is used to engage with the participants to allow intentional transparency while building relationships that enhance the study (Ravitch & Carl, 2016). Respondents in studies presented with a promise of confidentiality were more likely to provide in-depth information. In my role as the researcher, I kept that promise. According to Ravitch and Carl (2016), the researcher should consider ethics in design choices and scheduling. Participants in this study were able to contribute ideas and talk about their experiences without fear of losing credibility in the eyes of managers, families, and friends.

Power Differential

When I took on the researcher's role, I had the power differential roles of a leader, teacher, or supervisor to influence the interviewee. According to Barstow (2015), the researcher's power differential ensures that the participant has a sense of security and privacy protection and does not use it to influence. Writing researcher memos reminded me to stay neutral to obtain the in-depth understanding required for the study. As a researcher, I was not merely unilaterally collecting data; it was essential to conduct ethical and complex qualitative research (Ravitch & Carl, 2016). I accepted responsibility for making changes as needed to maintain the authenticity of the participants' experiences.

The use of Incentives

Incentives are cash payments to attract participants and thank participants for contributing their time. However, paying incentives involves ethical issues. The cost of incentives could be unaffordable. They could accelerate the selection process but influence participants' behavior. However, incentives could encourage participants to hold steady interest throughout the study. Incentives might encourage participants to complete the interview process to meet the study's timeline. The primary teachers' experiences were an attribute to the literature research. Therefore, I thanked the participants with an incentive. Participants learned about the incentive in the informed consent form, which stated that each primary teacher who completed the interview process would receive a thank you letter with a $15.00 Target or Amazon gift card immediately following each interview.

Methodology

The purpose of this qualitative study was to explore primary teacher experiences with implementing innovative kinesthetic and tactile learning in virtual settings. Exploring kinesthetic and tactile learning in virtual settings for primary grades might increase an understanding about improving future kinesthetic learning activities for primary students. In this section, I will discuss the participant selection logic and instrumentation. I will describe the recruitment of participants and data collection. Next is a description of the data analysis plan, the issues of trustworthiness, and the study's ethical procedures. The section ends with a summary of the methodology used for this study.

Participant Selection Logic

The purposeful sampling consisted of primary teachers. These participants were from a public school district, Facebook, recommended through the snowball process, and volunteered from a participant pool. The purposeful sampling strategy supported the study's criteria for participant selection. The justification for using the purposeful sampling strategy was to allow discretion for the researcher to select participants who might fit the study's criteria (Patton, 2014). I sought participants with the ability to provide rich context and detailed accounts according to the constructs of the study (Merriam & Tisdell, 2016; Patton, 2014; Ravitch & Carl, 2016).

The criteria base for selection consisted of primary teachers who pivoted to virtual settings using a curriculum with kinesthetic and tactile activities. These teachers continued implementing kinesthetic and tactile activities during the COVID-19

pandemic. The potential participants had to have a teaching license and had to teach in a public or private school in the United States. The inclusion criterion for participant selection was primary teachers who transitioned or implemented kinesthetic and tactile activities to a COVID-19 pandemic virtual setting. The exclusion criterion for participant selection was participants with no teaching license. I expected approximately six to eight participants for the feasibility of the study. Qualitative research usually has an estimate of six to 12 participants, whereas a purposeful sampling of 10 participants could support a high percent rate for providing the study's relevant information with no new themes (Francis et al., 2010; Mason, 2010). Guest et al. (2006) concluded that the first six interviews could form 80% of identified information. Therefore, eight primary teachers participated in the study.

The description of the relationship between saturation and sampling size is saturation by adding to the sampling size (Patton, 2014). The study reaches saturation under two conditions: (a) the data does not show an addition of themes or patterns, and (b) the data does not depict a new phenomenon (Burkholder et al., 2016). The sample size did not increase upon saturation (Merriam & Tisdell, 2016). I investigated early saturation to ensure that the sampling size varied due to details, such as context, personality, or roles (Lincoln & Guba, 1985; Patton, 2014). The combined conceptual framework supported the study to avoid saturation prematurely but revealed results with in-depth information.

Instrumentation

The study's instrumentation was the interview protocol, see Appendix A. The interview protocol consisted of a warmup question, semistructured interview questions with follow-up questions, and a debriefing statement. I used the research question and conceptual framework to guide the interview questions with follow-up questions. I shared the interview protocol with my dissertation committee. I developed a similar protocol to interview my peers, family members, and a close friend to practice my interview skills and to see what information I might receive to answer the research question.

The established sufficiency of the interview protocol was the study's literature review and the conceptual framework. The themes developed from the literature review established a sufficient basis for the interview questions to gather information. The lenses of the study's combined conceptual framework were the basis of the alignment. The design of the interview protocol consisted of Rubin and Rubin's (2012) conducting effective qualitative semistructured interviews. The authors noted the essential of telling participants that I would record the interview. They suggested establishing a rapport and remaining unbiased to capture in-depth information that the participant may not usually share on their own. The participants reviewed the preliminary findings to confirm the accuracy of my data analysis of the interview transcripts.

Procedures for Recruitment, Participation and Data Collection

I recruited participants from Facebook, through the snowballing process, from a school district, and from a participant pool. I collected the data during the individual interviews. I recruited the potential participants by using the following procedure:

- researched social media platforms relevant to the study's concepts
- contacted the social media group administrators or responsible contacts to ask for membership and approval to post the study's invitation to participate
- posted the invitation to participate in social media group platforms; for schools, I emailed the administrators individually; for snowballing, I emailed each participant
- emailed the informed consent to the proposed participant within 24 hours of receiving a reply
- received the consent form from the participant, who electronically signed it and emailed it back to me
- confirmed the receipt of the acknowledged informed consent, then scheduled an interview appointment and emailed the participant the interview guide for immediate access to the interview questions
- sent a meeting reminder with the interview questions to the participant on the morning of the interview.

The timeline for the duration of recruitment, data collection and analysis was 20 weeks. The duration for the interviews was between 22-52 minutes. I stored the recordings and transcripts on my computer at home in a password-protected file, and I will destroy them after 5 years.

Recording the Data

I collected the data during the interviews on the agreed meeting date and time. Before asking the interview questions, I informed the participant that I was audio recording the interview session. I collected the data using my iPhone with the speaker feature turned on. I audio-recorded each interview with my iPad and added Kaltura Capture as a second audio recorder to help recover data loss.

The interview process consisted of one interview with follow-up questions and probes. All participants were interviewed with the same interview protocol and procedure for consistency throughout the data collection process. I wrote researcher reflections about the experience from my researcher's perspective. Immediately following each interview, I generated a transcript with Kaltura Capture and put it in Microsoft Word. I wrote a reflection on each interview that comprised my views of behaviors and activities noted during the meeting (Ravitch & Carl, 2016). The researcher memos kept me mindful of reflexivity, positionality, and bias. I flagged new themes or patterns shared by participants in the researcher memos as a reminder to investigate any topic introduced during the interviews.

The transcript process started within hours of each completed interview. Then, I reviewed the transcript while adding or deleting words or phrases to correct errors from the machine transcription process. I emailed each interviewee a copy of the preliminary findings approved by my methodologist. I provided the preliminary review as soon as possible to improve the participant's memory of the interview. The interviewees

reviewed their data for accuracy and corrected it as needed; what they meant to say was precisely transcribed.

Follow-Up Plan for Too Few Participants

If recruitment resulted in too few participants, the follow-up plan was to use snowball and convenience sampling. I would ask participants to recommend teachers who fit the study's criteria. I created a pool of eligible participants in case I needed to add or replace a participant. I stored a file for each participant in the archival password-protected folder on my desktop at my home.

How Participants Exit the Study

Participants exited the study after I read them a debriefing statement. The debriefing took place over the phone or as the participants preferred. Appendix A shows that the debriefing statement is at the bottom of the interview protocol and was accessible to the participant throughout the study. In the debrief, I thanked the participants for participating in the interview process. I stated that participation was confidential and voluntary. I asked the participants for their contact information if I had any follow-up questions.

I had no interview follow-up meetings. However, my planned interview follow-up procedure was to send participants an email asking for follow-up information. Depending upon the topic, the participants may respond with an email. If we planned to meet over the phone, I would record the meeting the same as previously. I would send a meeting reminder with the follow-up questions before the discussion. After the interview follow-up, participants would exit using the study's debriefing form.

Data Analysis Plan

The data plan involved transferring the data from the transcripts to Microsoft Excel for inductive coding and themes. The data consisted of the recorded and reviewed interviews and my researcher memos supported by the study's main research question asking for the experiences of primary teachers who transitioned or implemented kinesthetic and tactile learning in virtual settings. I used Saldaña's (2021 descriptive analysis approach with In Vivo coding to understand teachers' usage of terms and phrases. Moreover, I applied Lincoln and Guba's (1985) approach to researcher reflexivity, ensuring accurate descriptions to encompass participant experience carefully. Then, I used pattern coding to categorize emerging concepts needed to theme the data.

Throughout the data analysis, I hand coded with Microsoft Word and Excel spreadsheets throughout the data analysis. The manner of treating any discrepant cases that arose included contacting the participants for clarity and exploring their discrepancies, if necessary. My final document included an explanation for all themes and discrepant cases in the data analysis section in Chapter 4. The discussion in Chapter 5 will include a return to the concept with contrasted findings with support from the literature.

Issues of Trustworthiness

In this section, I provided the appropriate strategies to increase or preserve the study's trustworthiness with credibility, transferability, dependability and confirmability using Lincoln and Guba's (1985) framework. Trustworthiness consists of criteria for measuring or testing the intended research goals. It is a critical component of the

qualitative research design (Lincoln & Guba, 1985). Achieving rigor in the design quality establishes trustworthiness, also called validity. I maintained the study's rigor in the real world rather than in a laboratory-controlled setting. It supported researchers' confidence that their activity recorded the phenomenon.

Trustworthiness concerning the participant selection and interview consisted of the openness of my connection to the study. The sampling size of eight was accurate in reaching saturation (Guest et al., 2006). Effective interview skills and questions enhanced trustworthiness. The research interview probes revealed authentic answers proving the accuracy of the content within the data source. Throughout the data collection process, I ensured that the transcripts from the audio recordings included exact verbiage and enough details for the data analysis process. My research memos reflected trustworthiness in my role as a researcher. I incorporated a preliminary findings review with the participants to add rigor to the design.

Credibility or internal validity is related to research design by ensuring the study's findings reasonably resemble truth and reality. The interview instrument and data are constructed to seek accounts for complexities or changes in patterns during the study and should include the researcher accountability (Lincoln & Guba, 1985). I ensured my data were rich, with multiple contributing factors complementing each other and biases challenged. The research methods aligned with the research question guiding the study. The findings closely matched the primary teachers' experiences. Credibility was critical to the design, where checking the data throughout the study was part of the design.

Qualitative research contains transferability or external validity when bound contextually with thick descriptions. Researchers could use the study in similar situations in different or broader populations (Lincoln & Guba, 1985). Transferability is only possible with thick descriptions rich enough to portray the circumstances to apply to others' concerns. It does not measure the thickness of the descriptions (Lincoln & Guba, 1985). Thick descriptions included a narrative about the data collection's context, methods, and timeframes. I provided thick descriptions presenting context and the data with detailed descriptions (Lincoln & Guba, 1985). The narratives can help other researchers decide how much of the study is similar enough to apply to their research.

Dependability is data stability, where the established research findings remain consistent and stable over the years (Lincoln & Guba, 1985). The data collected from the design are dependable in answering the research question. The sequencing of methods and a clear rationale of approaches within the research design answered the research question, proving dependability (Lincoln & Guba, 1985). The researcher can report detailed processes for future researchers to compare with other contexts. I provided enough information in my research to document the research design (Lincoln & Guba, 1985). The study's research methods were the same for all participants at any location in the United States. Over the years, the stability of the research should remain constant, adhering to the research method.

Confirmability is established research findings that portray the participants, not the researcher's bias or personal motivations.. Confirmability is to aim for non-involvement. Qualitative researchers who do not claim to be objective should show that

the results are not from the researcher's preferences (Lincoln & Guba, 1985; Ravitch & Carl, 2016). Researcher bias should not skew the participant's interpretation to fit a specific narrative. I established confirmability with the researcher's memos containing reflexivity. I justified the decisions for each data analysis step to accurately establish the study's findings by portraying the participants' responses.

Ethical Procedures

This study contains agreements with Walden's IRB (Institutional Review Board) to gain access to participants. The approved guidelines and templates are the letter of participation recruitment, informed consent, the study's recruitment, and the data collection log. Ethical practices within the research design increase trustworthiness (Lincoln & Guba, 1985). I sent an invitation to participate to the study sites listed on my IRB agreement.

The informed consent ensures that the language details of the study are communicable and states that the researcher imposes no harm upon the participants (Merriam & Tisdell, 2016). The participants electronically signed the informed consent form and selected "I consent" to let me know that they agreed to participate, given the parameters of the research. The participant returned the signed informed consent to my mail account as indicated on the IRB form. The invitation to participate and consent form mentioned me as a doctoral student at Walden University conducting research in partial fulfillment of a doctoral degree in education.

Participant procedures stated in the consent that the study was voluntary. The guidelines informed participants that they could refuse to participate and end their

participation in the study at any point. During the study, participants could question any part of the interview. Participants' identities and responses were kept confidential to the extent allowed by law. Participants remained anonymous in the study. I had no conflicts of interest and no outside ethical considerations. Moreover, I thanked the primary teachers with an incentive for their time and participation by sending an Amazon $15.00 gift certificate.

Ethical procedures included the treatment of the study's data. All research materials were in electronic format. During the study, I provided a pseudonym for each participant and a cross-name listing to store in the archival. I protected participants' privacy and confidentiality by being the only one to access raw data except for data shared with my dissertation committee. All data were password protected and archived in a password-protected WinZip folder on my laptop at home and an iCloud account to prevent data loss or destruction from my computer. I will destroy the data 5 years after my dissertation date, per the Walden University IRB guidelines.

Summary

Chapter 3 consisted of a description and rationale of my basic qualitative research design. The chapter included a restatement of the research question and defined the research tradition. I defined and explained my role of a researcher as an observer of the participants, handling researcher bias, and solving ethical issues. The methodology section included a justification of using purposeful sampling, explained the participant recruiting procedures, and described the relationship between sample size and saturation. The research instrument represented the source of data for the study. These qualities

provided a rationale to support the research questions and overall design. The content validity consisted of consistency in data collection, data analysis and reporting with thick descriptions to increase trustworthiness, credibility, transferability, dependability and confirmability. I established procedures for interview participation with informed consent and exit procedures for any follow-up for the study. The data collection took place online.

In Chapter 4, I will include the setting and describe the demographics and duration of the data collection. I will present any variations in data collection from the plan presented in Chapter 3, including trustworthiness. For data analysis, I will share the results, the emergent themes, categories and codes. Moreover, I will also present the key findings.

Chapter 4: Results

The purpose of this qualitative study was to explore primary teacher experiences with implementing innovative kinesthetic and tactile learning in virtual settings. Exploring kinesthetic and tactile learning in virtual settings for primary grades might increase an understanding about improving future kinesthetic learning activities for primary students. To accomplish this purpose, I established one main research question to guide the study: What are primary teacher experiences with implementing kinesthetic and tactile activities in virtual settings?

I conducted semistructured interviews with eight primary teachers, kindergarten through second grade. Data analysis consisted of identifying codes from their interview transcripts. I applied an inductive thematic analysis to create emerging categories from the codes and created themes to respond to the research question. In Chapter 4, I will present the setting, demographics, data collection, data analysis, evidence of trustworthiness, and a summary of how the data answer the research question.

Setting

The participants for this basic qualitative study were from a Facebook group, an elementary school, snowball strategies, and a participant pool. The participants were all primary grade level teachers from the western, central, and southeast regions of the United States. Personal and organizational conditions likely influenced participant experience at the time of the study. During participant recruitment, teachers returned to in person or blended teaching during the post-lockdown of the COVID-19 pandemic. Their

return to in person teaching likely influenced teacher experiences, participants' willingness to participate, and the interpretation of the study results.

Demographics

Eight primary teachers participated in the study through phone interviews. Table 1 presents the assigned number for each participant, the years of teaching experience, the number of students in the classroom, and the teaching current grade level. All participants implemented kinesthetic and tactile activities during in person learning and in a COVID-19 virtual setting. At the time of the interviews, all participants had returned to in person instruction. However, they each claimed to supplement in person teaching with virtual instruction, and they were continuing to implement kinesthetic and tactile activities in both settings.

Table 1

Participant Demographics

Participant	Teaching experience in years	Number of students in the classroom	Teaching current grade level
P1	28	22	Second grade
P2	30	21	Second grade
P3	33	21	First grade
P4	21	22	Second grade
P5	15	22	First grade
P6	9	19	Transitional kindergarten
P7	23	20	First grade
P8	11	22	Pre-Kindergarten

Data Collection

I received Walden University IRB approval number 07-12-22-1012452 for this study on July 15, 2022, and began recruitment. However, due to a lack of responses, it took a while to obtain participants. I conducted interviews between September 10, 2023, and January 5, 2023. During that timeframe, I returned to IRB with approval from my committee. I amended the selection criteria to expand the study's data collection to attract more respondents.

I extended the total of Facebook group administrator approvals to three. I turned to my friends for help. My former coworker provided me with two participants. I contacted my home school district via Google Search and visited the school district office onsite. The superintendent immediately permitted me to conduct research. The former superintendent of my local school district contacted the teachers' union to help me obtain four participants for my study. The district secretary individually emailed the participant invitations.

I conducted audio-recorded interviews with eight participants. Table 2 displays the data collection duration, the interview dates, and the length of each interview. I conducted a total number of eight phone interviews using the interview protocol described in Chapter 3. I audio recorded in two ways. I used the embedded feature on my iPad called Voice Memos and Kaltura Capture as a backup recording. Interviews ranged between 22 and 52 minutes. The data were collected as described in Chapter 3.

Table 2

Interview Logistics

Participant	Interview date	Interview length in minutes
P1	9/20/2022	51.53
P2	9/21/2022	22.09
P3	9/28/2022	32.47
P4	9/29/2022	27.08
P5	10/04/2022	24.25
P6	10/12/2022	35:39
P7	10/17/2022	30.00
P8	01/05/2023	32.05

There were a few variations in the data collection plan compared to what I proposed in Chapter 3. I made changes to enhance the study's feasibility. With my committee's approval and IRB permissions, I lowered the sampling size from 10-12 to six to eight participants. The goal was to increase the responses to the study's invitation. I expanded the invitation to participation to public school teachers. One of the schools required the principal's signature. The other school required approval from their IRB. The original call involved inviting teachers through Facebook, Twitter, LinkedIn, and snowballing.

I expanded the inclusion criteria to invite participants teaching preschool through second grade. The goal was to increase the responses to the study's invitation.

I changed parts of the inclusion criteria to attract more participants as follows:

- Past and/or currently teaching with online platforms or providing online instruction.
- The participants were currently teaching kinesthetic and tactile activities (learning with movement).
- Teachers implemented or transitioned learning with movement to a COVID-19 virtual setting

The original inclusion criteria stated the following:

- Teaching with kinesthetic and tactile activities two years before the COVID-19 pandemic.
- Kindergarten teachers who urgently transitioned their learning activities to virtual settings.

I encountered no unusual circumstances in data collection. Variations consisted of preparing the digital audio file to make verbatim transcripts. Instead of conducting interviews in Zoom, I used my iPhone and iPad. I called the participants on my iPhone. I used the speaker feature with enough volume to record the interview on my iPad. I recorded the interviews at my home in closed doors to ensure privacy and confidentiality of the interviewees. I had a backup in case my iPad malfunctioned, which was Kaltura Capture to audio record the meeting. Sometimes, I used Kaltura's audio and visual recording for transparency proving that I recorded the interview. I saw only myself on the iPhone. Additionally, I never saw the interviewees.

I transcribed each recording immediately following the interview. I accessed the transcript feature on Kaltura Capture and copied and pasted Kaltura's transcript report into a Microsoft Word document. I played the Kaltura recording with closed captions several times, comparing the audio with the Microsoft Word document and correcting any misspellings or misguided verbiage. I listened to each recording several times, and each time, I made corrections. I ran a Microsoft Word spell check to fix misspellings. I used the iPad recording that created a Voice Memo file that I can save on my laptop or in iCloud. On the first line of each interview's word document, I typed the pseudonym of each participant assigning each a different number. Participant 1 through Participant 8 pseudonyms were P1, P2, P3, P4, P5, P6, P7, and P8. I added the interview date, time, and length to each transcript. I consolidated the eight interviews into one document using Quirkos, a computer-assisted database for qualitative research. The Word document with consolidated interviews saved time when accessing spellcheck, search, and email all in one document.

Data Analysis

I used an inductive thematic coding process recommended for basic qualitative research (see Saldaña, 2021). To aid in the coding process, I developed a codebook with code definitions (DeCuir-Gunby et al., 2011); see Appendix B. The coding process consisted of elements from Saldaña's manual of procedures and mechanics of coding:

- Coding methods
- Preliminary jottings
- Sorting the data into categories

- Themeing the data and developing the summary table for the results

The Coding Process

The first phase of the coding process consisted of writing down preliminary jottings (see Saldaña, 2021) as soon as I created a transcript and before editing it. The preliminary jottings are in the codebook, a Microsoft Excel spreadsheet on my laptop. The preliminary jottings contained my first thoughts of codes and phrases. I immediately recognized the emerging patterns after each interview. Between the start and the end of data collection, I added preliminary jottings to the codebook to help me remember the fleeting thoughts and ideas that could add value to future data analysis and the writing of the results.

After listening to the interviews several times, I started the first cycle coding process. For the first cycle of initial coding, I used In Vivo and process coding (see Saldaña, 2021). In Vivo coding consisted of capturing the participants' language verbatim and describing trends and experiences. In contrast, process coding captured the teachers' and students' actions as they transitioned or implemented kinesthetic and tactile activities in virtual settings. Code samples include modifying, adapting, and learning. The codes ended with gerunds, "ing," implying activity.

Once the first coding cycle was complete, I moved to the second coding cycle, the pattern coding process, creating categories from the most frequent participant responses. The pattern coding process consisted of grouping the initial codes into categories (see Saldaña, 2021). I grouped the codes by occurrences for emergent categories by the

similarity of patterns, ideas, and terminology. The initial codes formed a meaningful group for the following hierarchy, the categories.

Next, I moved to developing the themes. After coding across the participants, I conducted a check to ensure the wording of the codes and excerpts aligned with the transcripts. I copied and pasted the interview question responses into the last worksheet of the codebook and sorted the categories alphabetically in preparation for the emergent themes.

I used the categorical theme method to develop the themes (see Saldaña, 2021). I created the themes from my interpretation of the codes and categories I developed from the interviews. I used memos to focus on recognizing patterns of data developing after each interview. I looked for ways to link together the patterns.

The themes contain descriptive details related to the categories. I switched from Microsoft Excel to paper and pen to create the themes. I looked at the surrounding data to ensure each theme contributed to answering the research question. After reviewing my scenarios, I identified the themes determining saturation and themes mentioned by a few participants. Then, I developed the data analysis report presenting the results. There were no discrepant data; therefore, this did not impact data analysis.

Then, I repeated the coding process several times to fit more data into fewer codes, lumping the data resulted in a concise set of 27 codes. See Appendix B for the code definitions located in the study's codebook. I repeated the Pattern coding process with the 27 codes and emerged 11 categories. Next, I grouped the 11 categories into five

emergent themes. Table 3 shows a summary of emergent themes and categories from the data sample quotes from the participants.

Table 3

Summary and Quotes for Themes From Data Analysis

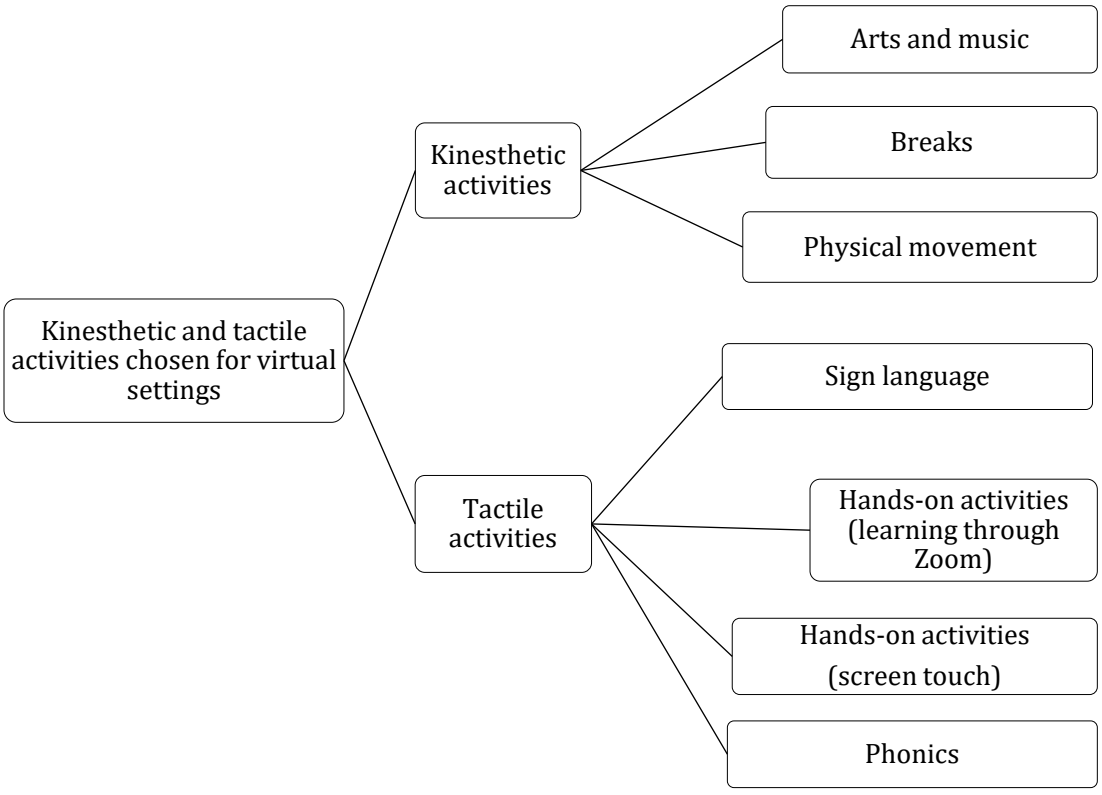
Five themes	Categories	Sample quotes
Kinesthetic and tactile activities chosen for virtual settings	Kinesthetic activities Tactile activities	"Kinesthetic and tactile was very important during Zoom," (P2)
Technology chosen for primary students	Electronic devices Online applications	"I would have them get up and move even though we were on Zoom," (P5)
Teachers adapted lessons	Taking advantage of available resources Using manipulatives Actively participating	"My husband and I actually invented a device … to put their worksheet paper … and then they could see actually what I was teaching … we took that whole process and put it on Amazon and started selling them," (P2) "Some of the activities were identical to what I would do a classroom, remodeled them on the screen," (P1) "A lot of it was building lessons and trying to find like really creating, getting good at technology. A part was creating these lessons from scratch," (P6) "We actually created a lot of manipulatives and materials for families to pick up and take home so that we can do those activities with the kids through online," (P6)
Student engagement	Holistic Virtual learning activities	"I think as far as the academics, I think it definitely helps get them more engaged because otherwise they're just staring at a screen," (P5)
Opportunities	Restructuring Learning from experiences	"So always plan for something hands-on. And I mean from Pre-K students all the way up to the adults, having hands-on time and planning for it ahead of time, will help improve the student's focus and engagement," (P8)

Kinesthetic and Tactile Activities Chosen for Virtual Settings

The theme, kinesthetic and tactile activities chosen for virtual settings, applied to data describing primary teachers experiences with their choice of the most effective learning activities to support learning and comprehension in virtual settings. The theme included two categories and seven codes. I categorized codes as kinesthetic activities if the learning activity require a total body movement approach to be most effective, and I categorized codes as tactile activities if learning and remembering is through the sense of touch using the hands. I did not exclude any data. See Figure 2 for the code tree.

Figure 2

Code Tree for Category of Kinesthetic and Tactile Activities Chosen for Virtual Settings



Kinesthetic Activities. The codes for the category of kinesthetic activities were *arts and music, breaks*, and *physical movement*. Concepts excluded from kinesthetic activities were physical touch, the touch screen, hands-on activities for phonics or reading, sign language, and any activity coded as tactile in this study. The three codes addressed the physical movements chosen for learning activities in virtual settings. They included kinesthetic activities such as learning through arts, music, and movement. Teachers asked students to jump, run, sit, and stand up to increase learning and remembering. Teachers reported that they asked students to take frequent breaks from sitting at the screen, which increased energy to support student engagement. Teachers used these learning activities with educational software and online platforms like Zoom.

Tactile Activities. The codes for the category of tactile activities were *hands-on activities (learning through Zoom), hands-on activities (touching the screen)*, *sign language*, and *phonics*. Concepts excluded from tactile activities were running, jumping, sitting, taking breaks, arts, music, sign language, and any active coded as kinesthetic in this study. The codes addressed the hands-on activities (screen touch) referring to students learning with software requirements guiding them to touch the screen. Hands-on activities (screen touch) were students moving objects, using drag and drop, or drawing on the screen. Hands-on activities (learning through Zoom) referred to instructional learning activities through Zoom sessions. Zoom activities were clapping, chopping out words and using manipulatives or tangibles. For example, the teachers asked students to draw and share in virtual settings through Zoom. Sign language consisted of tactile hand movements to communicate as appropriate by grade level. Phonics with tactile refers to

movements to learn letter sounds for reading. Teachers taught these tactile activities through educational software and online platforms and in Zoom.

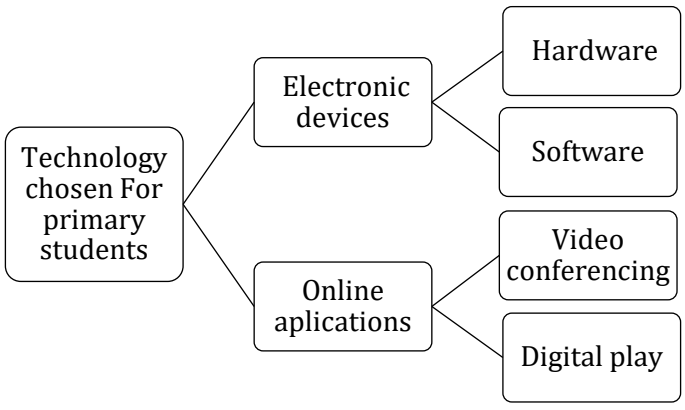
Technology Chosen for Primary Students

The theme, technology chosen for primary students, applied to data describing primary teachers' experiences with choosing the most effective technology to support learning and comprehension in virtual settings. The theme included two categories and four codes describing the hardware, software, video conferencing platform, and teachers' experiences with digital play. The participants pivoted their curricula to align with technology and software. They ensured the hardware was capable of touch screens and videoconferencing. The software provided kinesthetic and tactile activities. Some software offered fun activities during breaks. For example, GoNoodle consisted of physical movement during breaks. I did not exclude any data.

See Figure 3 for the code tree.

Figure 3

Code Tree for Category of Technology Chosen for Primary Students



Electronic Devices. The codes for the category of electronic devices were *hardware* and *software*. The primary teachers chose electronic devices appropriate to their present grade level. The category also referred to the software teachers selected for virtual settings. The software included learning activities for gaining knowledge through the class online experiences.

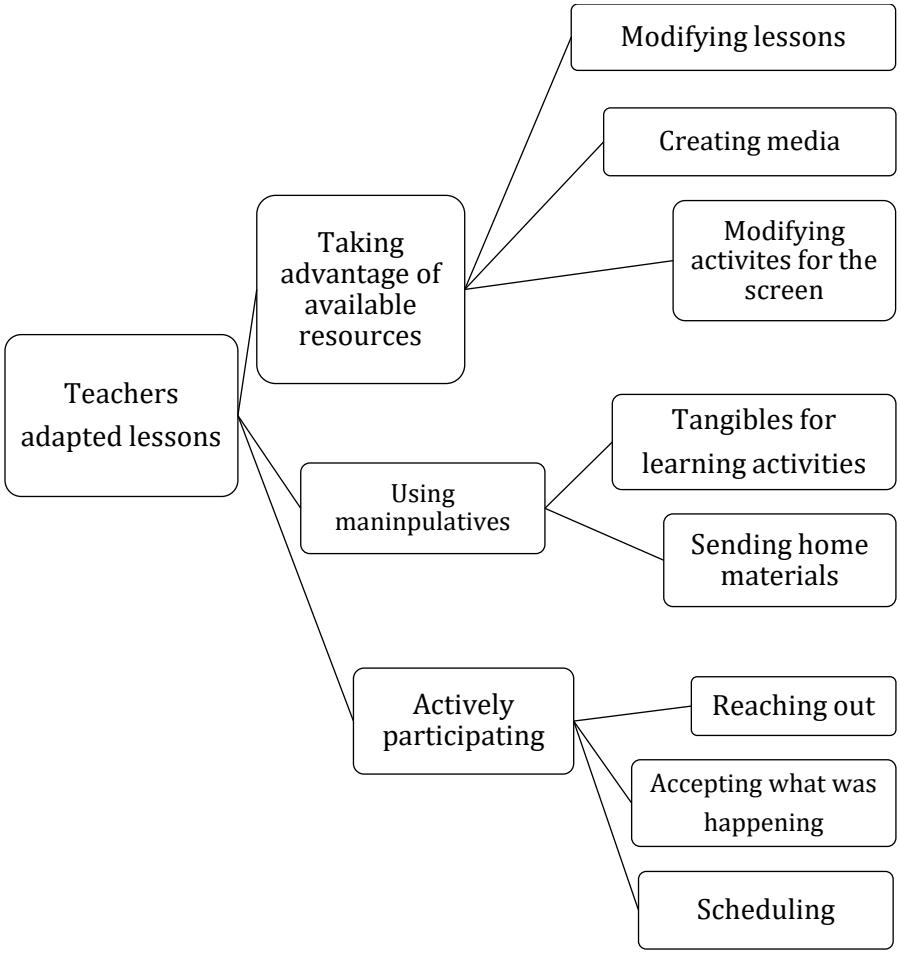
Online Applications. The codes for the category of online applications were *video conferencing* and *digital play*. The software included Zoom, which provided an interactive learning platform for kindergarten through high school students. Digital play had software programs known to increase cognitive stimulation.

Teachers Adapted Lessons

The theme, teachers adapted lessons, applied to data concerning primary teachers' actions as they urgently transitioned to or implemented learning activities in virtual settings. The theme included three categories and eight codes. The participants adapted lessons for virtual settings by taking advantage of available resources, modifying lessons, creating media, and modifying activities for the screen to include kinesthetic and tactile activities similar to in person learning as suggested by UNESCO (2020). I did not exclude any data. See Figure 4 for the code tree.

Figure 4

Code Tree for Category of Teachers Adapted Lessons



Taking Advantage of Available Resources. The codes for the category of taking advantage of available resources were *modifying lessons, creating media* and *modifying activities for the screen.* The participants pivoted their curriculums by making new lessons designed for virtual settings, and some teachers used online platforms. The COVID-19 pandemic caused teachers to urgently modify available resources for screen

use. They also created new lessons, lessons on videos, and modified hand signals for virtual settings.

Using Manipulatives. The codes for the category of using manipulatives were *tangibles for learning activities* and *sending home materials*. Primary teachers sent home manipulatives for students to use for the learning activities during online learning. They were physical or tangible tools to help students learn math and reading during Zoom sessions. The tools include letters, numbers, Play-Doh, and blocks. Virtual manipulatives were part of software learning applications. For example, students could drag and drop objects to help them learn to count.

Actively Participating. The codes for the category of actively participating were *reaching out*, *accepting what was happening*, and *scheduling*. The category emerged from codes describing primary teachers' actions and commitments toward the students, families and school faculty. The codes indicated data showing teachers' continual actively participating; most importantly, they were in a different learning environment requiring a shortened school session schedule.

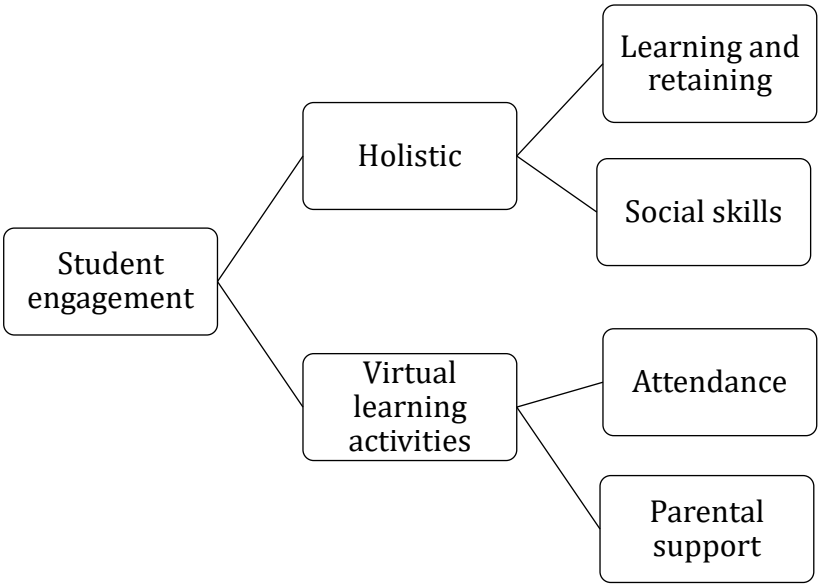
Student Engagement

The theme, student engagement, applied to data about primary teachers' ideas addressing holistic learning and virtual learning activities. The theme included two categories and four codes. The holistic category had codes, *learning and retaining* and *social skills*. The virtual learning activities category codes were *attendance* and *parental support*. Student engagement applied to data related to the holistic curriculum. Primary students learn with a holistic curriculum. Kinesthetic and tactile activities support

learning and retaining. Student attendance and parental support codes were related to holistic curriculum in the virtual settings as supporting student engagement.-See Figure 5 for the code tree.

Figure 5

Code Tree for Category of Student Engagement in Virtual Settings



Holistic. The codes for the category of holistic learning were *learning and retaining* and *social skills*. The codes applied to how virtual kinesthetic and tactile activities support holistic learning, which included learning and retaining and increasing social skills. The participants mentioned concerns about the student's home environment and how it affected their learning. Additionally, the participants stated that social skills increased very little in virtual settings with learning activities. In contrast to in person

learning, there were no physical interactions. The participants could only demonstrate the learning activities in virtual settings.

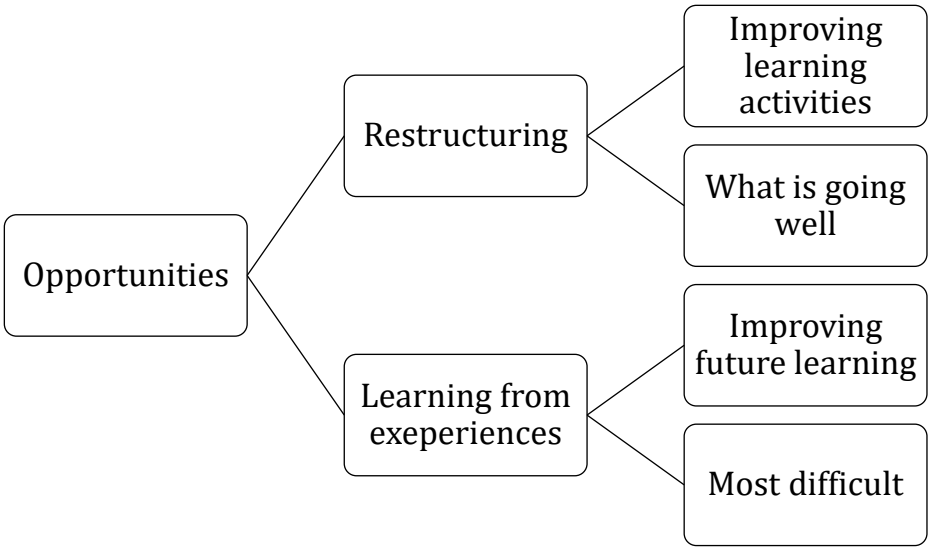
Virtual Learning Activities. The codes for the category of virtual learning activities were *attendance* and *parental support*. The category emerged from codes describing student participation and attendance to improve student engagement as they participated in kinesthetic and tactile activities in a COVID-19 virtual setting. Additionally, teachers looked towards parental support to assist students with virtual learning activities. For example, students should have sufficient study space. Teachers suggested that student attendance and learning at home in virtual settings affected student engagement.

Opportunities

The theme, opportunities, applied to data that discussed how teachers made sense of their experiences to embrace opportunities from their challenges. The theme has two categories and four codes. I did not exclude any data. The participants shared opportunities to restructure learning in virtual settings for kinesthetic and tactile activities from their experiences. The data codes described what went well, the difficulties, and how participants improved learning activities for future learning. For example, a teacher shared how they taught phonics with tactile activities in Zoom. See Figure 6 for the code tree.

Figure 6

Code Tree for Category of Opportunities



Restructuring. The codes for the category of restructuring were *improving learning activities* and *what is going well*. The category emerged from codes describing what participants shared about improving learning activities in virtual settings. *Improving future learning* activities included students having books in their hands while learning in Zoom, providing interactive learning, reviewing new learning software applications, and planning positive and fun learning experiences for students.

The code, *what is going well*, applied to teachers' sharing experiences of discovering new opportunities to enhance learning activities. Participants shared that hardware accessories such as headphones and improved study spaces can help increase learning activity participation. Participants shared ideas for restructuring learning in virtual settings, such as obtaining new software programs, making more time for lesson planning, and creating sign language for all students in virtual settings.

Learning from Experiences. The codes for the category of learning from experiences were *most difficult* and *improving future learning*. Teachers shared what was most challenging about teaching with learning activities in virtual settings. Participants shared that not being able to physically see students was the most difficult. The code *improving future learning* consisted of participants indicating that hands-on activities, software such as TypingClub, engaging students, and screen breaks can help improve future learning.

Discrepant Cases

This study did not produce any discrepant cases because all eight participants indicated similar information. Also, all participants contributed to this study by sharing their challenges, adaptability of resources and creativity to motivate student learning. They suggested how to improve future learning. The participants stated that digital play should be age appropriate. Kindergarten and first-grade teachers indicated that digital play did not help students learn and comprehend information. However, it is more applicable for second-grade students because they can read and have solid tactile functionality. As indicated in Chapter 3, this study employed a purposeful sampling strategy. The study expanded participant selection based on grade levels with holistic and active learning.

Evidence of Trustworthiness

In this section, I will describe how I upheld the issues of trustworthiness, credibility, transferability, dependability, and confirmability. Trustworthiness is a critical component of qualitative research showing transparency throughout the qualitative

research design. I used the Lincoln and Guba (1985) framework for reliability, transferability, dependability and confirmability. In this section, I discuss my strategies for providing evidence of trustworthiness.

Credibility

Credibility or internal validity relates to research design. I constructed the instruments and data to seek accounts for complexities (Lincoln & Guba, 1985). I established credibility by accurately identifying the research participants. I provided reflexivity in each interview, focusing on the interview questions and responses. As needed, I added interview probes to help reveal authentic answers proving the accuracy of the content. Throughout the data collection and analysis process, I wrote researcher memos to reflect my trustworthiness in my role as a researcher. I provided member checking of the findings to add rigor to the design. The research methods aligned with the research question guiding the study. The results closely matched the primary teachers' experiences.

Transferability

Qualitative research contains transferability when researchers can use the study in similar situations in different or broader populations (Lincoln & Guba, 1985). Transferability is only possible when the thick description provides a rich enough portrayal of circumstances to apply to others' concerns. For transferability, I wrote thick descriptions with narratives about the context, methods, and timeframes for the data collection. The study's purposeful sampling recruitment consisted of information supported by thick, detailed descriptions.

Dependability

Dependability is data stability, where the established research findings remain consistent and stable over the years (Lincoln & Guba, 1985). I reported detailed processes for future researchers to compare with other contexts. I provided enough information in my research to document the research design and sequence of methods. I followed the interview process and followed the IRB's instructions. I read each transcript and listened to the audio recordings several times for data confirmation. I continued a line-by-line reading throughout the coding process to provide accuracy for the codes, categories, and themes.

Confirmability

When research findings portray the participants and not the researcher’s bias or personal motivations, it reaches relative neutrality (Lincoln & Guba, 1985; Ravitch & Carl, 2016). I did not know the participants, and they did not know me or had never met me. Not knowing nor having to network with the participants ensured the study could remain in an unbiased environment during interviewing, the coding process and data analysis. I ensured the strategy aligned with the research question and approach through meetings with my dissertation committee. The participants reviewed the preliminary findings to confirm that my analysis and their transcripts were accurate.

Results

In this section, I organized the results by the themes. For each theme, I included the categories and participants' excerpts. Each theme is an experience shared by the participants. I determined that the five themes and 27 codes aligned with this research question.

Theme 1: Kinesthetic and Tactile Activities Chosen for Virtual Settings

Theme 1, kinesthetic and tactile activities chosen for virtual settings, consisted of two categories of codes: *kinesthetic activities* and *tactile activities*. The categories described the types of kinesthetic and tactile activities the participants used in virtual settings.

Kinesthetic Activities

All eight participants (P1-P8) shared their chosen physical movements to help students comprehend information while learning in virtual settings. Kindergarten teachers P6 and P8 used the same kinesthetic activities. Participants described how they implemented body breaks, danced paired with a song, and sang with music and motion. The first-grade teachers P3, P5, and P7 shared that they asked students to jump, get up and move, and dance.

Second-grade teachers P1, P2, and P4 mentioned software resources supported by learning activities. P1 shared, "we learned our sounds through Zoo Phonics software application … and that's with motion, making gestures, and learning math while making movement." P2 carried out kinesthetic activities using another software application called GoNoodle that included dance and exercise. Another way participants said they

implemented learning activities was to ask students to step away from their laptops and learning space. P4 shared, “on virtual learning we gave them an hour’s lunch …We would remind them to go outside … run five laps … do jumping jacks … don't sit in that house … don't be on your tablet playing video games or watching TV.”

The teachers chose kinesthetic activities that they felt best increased learning for their grade level. The following excerpt by P3 explains why they used physical movement to improve learning and comprehension:

> It would be also anything that would get them to be able to get up and move … It just brings learning closer to the brain and makes the brain connect. The neurons in your brain connect to your fingers and it makes you remember things. I might say you have to remember something 15 times before you get it. Kinesthetics and tactile activities speed it up … the crossline, but if they cross the middle section of your body, … they [students] remember it more. So, the repetition over and over again of that.

The participants emphasized that a mixture of movements increases motor and cognitive skills, so engaging students in different moving activities help them learn effectively.

Tactile Activities

Tactile activities were hand movements. All eight participants used tactile activities in virtual settings. The teachers shared different tactical activities they used to help students learn in virtual settings. Kindergarten teachers P3, P6, P7 and P8 stated that they used online drag-and-drop. Students used their fingers to move objects in virtual activities within software applications. Many of their students should wait for their motor

skills to develop more to use the mouse effectively. Additionally, another tactile activity often used was making shapes with play dough while following the teachers' instructions on Zoom.

The participants mentioned that clapping is a beneficial tactile activity in Zoom. P1 and P5 stated that students clapped or chopped out sounds and syllables. They also mentioned that tactile activities support building a project and that science is a hands-on activity. P2 felt that kinesthetic and tactile were very important during Zoom. Hand signals can improve student engagement in Zoom. P4 and P5 used American Sign Language (ASL) to support remembering. P5 explained a strategy for using ASL and using manipulatives with learning activities during Zoom:

> I'm really big on using American Sign Language (ASL) daily, … [For example,] going to the restroom, [saying] me too, or things like that. In first grade, we did much work with letter names and sounds. I drew a lot with numbers and practiced letters in the air for letter formation. [In Zoom] I asked students to make clay letters by tracing the grooves that form the letters. We had varied learning activities. Science was definitely hands-on in my classroom and on Zoom. For example, there were plenty of hands-on science experiments.

P5 made clay letter manipulatives for students learning in Zoom. Teachers reported that tactile movements facilitated interactive software and tangible materials to promote and help students assimilate information from touch and consolidate them into skills.

Theme 2: Technology Chosen for Primary Learners

Theme 2, technology chosen for primary learners, consisted of two categories of codes, *electronic devices* and *online applications* which include participants experiences with their choice of technology for kinesthetic and tactile activities. All eight participants reported that their school administration either checked out or gave students iPads or laptops during school closures. P3 stated, "Parents came to school, got all their supplies, and had an iPad checked out to each student."

All eight participants shared that they adapted to learning on the screen. They used screen features to enhance the view of the lessons. However, they had no control over a frozen screen or when a student decided to turn it off or walk away and leave it on. The participants used non-technical skills, such as communication, to adapt learning on the screen. The participants contacted the parents or providers. P1, P5, and P8 shared that they modified learning activities for the screen.

Additionally, P3, P4, P7, and P8 changed the screen view by launching the split screen feature that operates two or more software applications. The split screen allowed teachers to observe students as they completed the learning activities. The modifications improved how teachers monitored students while they completed their assignments. The split screen feature was a good strategy that helped participants observe the students.

P1 shared how other hardware and accessories had been suitable for learning activities:

> And even if you didn't have [your own] room, you can put a headset on. You can have the desk facing the wall so that your back is to anyone you don't need. I told

> them, the people in my class, you do not need to be in the room. … Now, I was always concerned that my second graders may not fare well on the state testing in third grade if they could not navigate a keyboard or a Chromebook or know how to function with it, because I found that many kids were well-versed on iPads and tablets but not versed in a computer or a Chromebook.

The participants identified hardware attributed to students' physical abilities. In kindergarten, students used handheld devices. Starting in second grade, most students learning with tactile movements acquired motor skills for operating the laptop.

All participants shared that at the start of the COVID-19 pandemic, they immediately searched for online resources and helped each other to select software appropriate for their primary grade level. They all implemented the following software programs in virtual settings: (a) GoNoodle (GoNoodle, 2023), (b) Google Jamboard and Google slides, (c) i-Ready (Curriculum associates, 2023), (d) Interactive Elkonin boxes, (e) Raz-kids (Lazel Inc., 2023), (f) Seesaw (Seesaw, 2022), (g) Starfall (Starfall Education, 2023), (h) SIPP (systematic instruction in phonics or phonological awareness and phonics) (SIPPS, 2023), and (i) TypingClub (Edclub, 2023).

As the pandemic proceeded, some teachers used online learning platforms. P1, P6, and P8 shared that they teach in virtual learning platforms. Much of the software mentioned supported teachers in modifying lessons. They enabled students to access online manipulatives and support scaffolding with learning activities to speed up comprehension and gain long-term practice and learning skills.

For online applications, all eight participants stated that they used Zoom video conferencing. The students could follow learning activities as instructed by their teachers. P8 accessed the Zoom platform to demonstrate how to make letter and number shapes with playdough to prepare them for reading. Furthermore, the participants mentioned that clapping was a beneficial tactile activity in Zoom. P1 and P5 stated that students clapped or chopped out sounds and syllables. Also, all eight participants used Zoom to help their class see how to build a project and use science and hands-on math activities with manipulatives. Even so, hand signals can improve student engagement in Zoom for example, P4 and P5 used the American Sign Language (ASL) to support learning.

Online applications applied to digital play for primary students. Kindergarten and first-grade teachers stated they do not use digital play because it provides limited learning for their grade level. P6 stated that using digital play depended upon the topic: “I think it depends on … the purpose and the age of development. Right now, I'm in transitional-kindergarten and I have very minimal technology right now because I want them to be moving a whole bunch.”

Second-grade teachers used digital play. They indicated that digital play supported tactile or hands-on activities to learn math, phonics, and typing. Also, students can perform collaborative work through digital play software.

Theme 3: Teachers Adapted Lessons

Theme 3, teachers adapted lessons, consisted of three categories of codes: *taking advantage of available resources, using manipulatives*, and *actively participating.* During the COVID-19 pandemic, all the participants took action to urgently pivot their

curriculum to virtual settings. They turned to resources already available in virtual settings. The participants selected manipulatives used for in person learning to assist in virtual setting learning activities. All eight participants responded to the change by actively participating. They found a way to keep moving forward with their curriculum: Their actions constitute their experiences with kinesthetic and tactile learning in virtual settings.

Taking Advantage of Available Resources

All eight participants took action to modify their current learning activities to support kinesthetic and tactile activities in virtual settings. The participants scanned documents for online accessibility for the class. The books in virtual settings allowed teachers to continue their lessons started at the beginning of the school year. P6 explained why teachers turned to scan as one of the first ways to adapt to learning in virtual settings:

> It was almost like; the screen created such a huge barrier. We would have to find everything online for them to even develop some kind of interest. And if we did not find it online, then we had to scan it, upload it, put it into programs, things like that.

Some documents were accessible online. P5 expressed how e-books saved teachers time from having to scan: “I felt good about learning how to use more of the online resources that are already available. Like the textbooks that are already, they already have online resources.”

All eight participants created new online lessons using Google Jamboard and Google Slide to support the virtual settings. Google Jamboard is a digital whiteboard that operates in real time and is accessible on different devices. Google Slide is an online presentation show where teachers can update the slides in real time. P2 shared that they invented a screen projection for her class:

> I was not able to project an image of what I was trying to teach and use manipulatives, tactile experiences with the children. So, we actually, my husband and I actually invented a device … the students could see actually what I was teaching. And that was very beneficial.

Although document scanning has been available as a resource since the COVID-19 pre-pandemic, the process became more popular to urgently adapt to virtual settings. On the other hand, some books were accessible online. Additionally, participants created lessons for the virtual settings, and some teachers used learning platforms.

Using Manipulatives

Tangibles were natural objects for tactile activities. All eight participants stated that they needed manipulatives hands-on during virtual learning. They were essential learning tools for primary students. All eight participants created a set of manipulatives to send home to support learning activities in virtual settings. The initial codes indicated that participants used manipulatives to support PE, math, phonics, and reading. P3 described the manipulatives students used for math:

> Manipulatives for math were anything that would get them to do hands-on, they were center-type things for reading. It would also be anything that would get them

> to be able to get up and move and use their touch, touch the letters and move the letters of the alphabet.

Manipulatives assisted tactile activities for spelling. The items sent home for virtual settings helped with learning and remembering letters, sounds, and syllables, as P4 stated, "I also do a lot of manipulatives, where we are making words, or we are using counters and math, so we're using base 10 blocks. We also do a lot of hand gestures."

Manipulatives or tangibles used in Zoom were items for math, such as counters that were buttons, base 10 blocks made of foam, cut-outs, and rulers. For phonics, students used plastic letters and clay. P6 described the manipulatives as providing hands-on activities to show understanding or create understanding. Students made shapes out of Play-Doh to recognize letter shapes and increase motor skills while learning with Zoom, as P8 stated:

> Literacy was usually when I have them play with the Play-Doh. When they first got to it, I just had them open it up, feel it and describe what they felt. That is a part of literacy because they have to use those verbal words.

Manipulatives were learning sources available during the COVID-19 pre-pandemic. Students used them for tactile activities. Sometimes teachers use them with learning activities in virtual settings to help with comprehension and remembering. The participants sent manipulatives to be available during learning activities or for students who might use them for learning from play.

All eight participants shared that they took action to send home school learning materials by asking parents to pick them up. The participants were not go to students'

homes during school closures due to the COVID-19 pandemic. P5 stated, “That was a big challenge, I think was getting the materials for the kids.” All participants also created sets of materials for pickup, including the manipulatives and any needed school supplies. Although primary students required materials in their hands, they also needed internet access as they learned in virtual settings. P7 shared, “technology was sent home, and hotspots were sent home.”

The inequity between advantaged and disadvantaged students did not come up in this study. The teachers ensured that all their students received school supplies. They just needed the parents to pick up the materials.

Actively Participating

All eight participants were actively participating in taking on change to their curriculum. The participants were dedicated to supporting and pushing students through the disrupted learning changes, even if participants were tech-savvy. For example, *they reached out to students* during break-out sessions. In Vivo coding and interview excerpts captured their responses verbatim. The online break-out rooms allowed teachers to split their classes into smaller groups. P2 shared, “It was hard trying to make sure I went to every room, so they knew that I was for real … [I would] use them [the rooms] to communicate with students effectively.” Break-out rooms were helpful for one-on-one time. Actively participating included *accepting what was happening*. P5 explained how they had to quickly transition to virtual settings with limited time to coach students:

> There wasn’t any time to coach the kids on any motions … As far as teaching letter sounds like phonemic awareness, [it] wasn’t too hard because I feel like

> they're watching me do it up close on a screen. They could see me. It's not as good as in 3D, obviously. But, I was still having them practice making all the sounds … So, that's better than nothing, but obviously not as good as watching a real-life person do it

P3 continued teaching letter sounds while knowing that the process may not be as effective as the face-to-face. Actively participating included *accepting what was happening*. P8 stated, "I feel like the main challenge was all those things had to be taught. We had to teach the children how to use them. And so, they weren't just toys and they weren't distractions and manipulatives." Participants realized they needed to continue teaching while searching for new learning methods; actively participating was essential in every step of the teachers' actions.

All eight participants shared positive experiences concerning support from the school districts. The teachers also accepted the new scheduling for virtual learning sessions. Online learning sessions in Zoom convened for between one and a half hours and two hours. Participants' excerpts indicated that the school districts supported the learning activities in virtual settings. The school districts hired specialized people. P1 shared, "students were able to log in and do music, dancing, PE, and different things with specialized people." A school district asked one of the participants for online help. P1 explained, "I ended up teaching midway to the entire school district methods that helped me become effective…Why did they not ask me at the beginning of the school year? Why did it take five months for me to come on? I was already involved with tech prior to the pandemic."

The school district helped with internet access. P3 shared, “The school district, we had a tech line that the parents could call.” Furthermore, although many books were online, P7 shared, “The school district provided books and paid for Zoom.”

All eight participants indicated they experienced changes in *scheduling*, which consisted of shortened school hours for teaching in virtual settings. Although teachers felt the school district did a great job with support, they took action to provide more input to improve learning in virtual settings.

Theme 4: Student Engagement

Theme 4, student engagement, consists of two categories of codes: *holistic* and *virtual learning activities*. All eight participants frequently noted that they supported student engagement to keep students’ attention and interest. The teachers took action to keep students engaged in learning. P2 shared, “We would do a little bit of something, and then we would go to maybe a break-out room,” Participants described how a variety of learning activities increased student engagement. For example, P1 stated, “Stuff was so engaging, and the kids so much wanted to talk with other students, they would stay on.” Students usually have a favorite learning activity for student engagement. P5 shared, “They were more interested if it was like GoNoodle.”

On the other hand, there were times when student engagement was hard to obtain. P3 stated, “Yet, you’re trying to show them how to do things. They're looking at you kind of gone,” The participants stated that they implemented a variety of kinesthetic and tactile activities to maintain the student engagement that they could not have in person and to keep students from separating themselves from the learning session.

Holistic

All eight participants reported that kinesthetic and tactile activities supported holistic learning. They reflected teacher experiences with holistic learning, including playing together. Kinesthetics and tactile activities can link holistic education to physical activities. P7 stated, “Obviously, movement and tangible things are very good for learning and instruction. It’s just very difficult online.”

Holistic includes learning for the whole student. Learning provides a wide range of academic and social skills. P1 stated, “I think that you need it all in order to get some people to retain information by chance. Some are visual, and you need a lot of visuals.” Participants also shared that in their classroom, learning activities and visuals supported holistic learning for the primary classes. P6 explained why social skills, such as playing together, should also be considered as providing holistic learning activities for primary students:

> I truly believe that playing together and experiencing things together allows children to engage in conversation, which develops their ability to think critically, and in ways where they can question each other without an end habit … I am a huge supporter of tactile.

However, P8 did not agree that kinesthetic and tactile activities supported holistic learning:

> And so, I personally think that kids learn best through play … But as far as [kinesthetic and tactile activities] making an actual improvement on holistic

> learning, I would say no. Now, engagement-wise and helping them be motivated, definitely.

In addition to holistic learning, P4 reported that kinesthetic and tactile activities in virtual settings do not improve social skills. According to P4, "So it couldn't have helped with social skills or academics." The participants discussed ways kinesthetic and tactile activities affect social skills. The results showed that participants shared mixed ideas on learning activities increasing social skills. They also reported that the allotted time for learning in virtual learning sessions might affect the time students have to increase social skills.

Virtual Learning Activities

All eight participants stated that some students would not log in or return after attending specials, or they would turn off their screens. Teachers noticed students were absent during the shortened school schedules. Students often looked away from the screen due to distractions affecting their learning space. P7 and P8 discussed that many students did not show up. The participants expressed concerns about absenteeism during school time and upon returning from the break-out rooms. P7 shared, "So, there's a lot of absences … Furthermore, students were home but did not participate in school. P3 stated, "And I had four of them that never came on the line … They just stayed at home, and they would get on, do their assignments, but never would turn anything in." Distractions with children close by caused absenteeism for some children. P4 shared,

> Another challenge was some parents still had to go to work. They would take their kids to a babysitter's house. There might be seven to nine kids at one house,

> really distracted even with the headphones on, looking around, seeing what the other kids are doing.

Absenteeism and distraction existed even as students were at home. In virtual settings, students could be present without really being present. Initial codes did not represent data presenting how teachers dealt with attendance; however, many codes illustrated teachers improving student engagement.

Parental support was essential for picking up school supplies and being home when school convened. P3 shared, “Parents came to school and got all their supplies.” The supplies were essential for supporting learning activities. P6 stated,

> Sometimes people weren’t able to get the materials … we wanted them to build a lot of the things we knew needed to be tactile for that age, right. We wanted to make sure that they at least had materials and you would do that almost weekly and make sure we have materials for the next week.

Parents who were not helping either worked, looked for jobs, or were sick. P5 stated, “It was challenging because not all the families would come to the materials pickup. Not only were some parents not picking up essential materials, but many also had to work. P3 shared, “Then you had the parents that were working their job from home, and they were trying to figure out how to do their jobs at home or elsewhere, how to make ends meet because they lost their job.”

Students home by themselves had to take care of themselves while parents had to work. P6 stated, “But what that meant was, you know, kids could get up when they needed or

wanted to at any time. They can eat whenever they want to. They could shut off their computer, even if you called them."

The parents supported learning with virtual settings as much as they could. Participants did not mention parents' roles in kinesthetic and tactile activities, but parents picked up the school materials supporting learning activities that the teachers sent home.

Theme 5: Opportunities

Theme 5, opportunities, consists of two categories of codes: *restructuring* and *learning from experiences*. All eight participants shared ideas from their experiences about the opportunities for teaching and learning in virtual settings. They shared restructuring, how to improve learning activities and what went well. The participants shared learning experiences during virtual sessions, what was most difficult and ways to improve future learning.

Restructuring

All participants shared that the virtual settings had room for restructuring and improving learning activities. P1 stated, "It could be a program half-time virtual and half-time in person." The participants agreed that more collaboration and support between students, teachers, and parents would restructure virtual learning. P8 stated, "Once [students] have the proper support, it'll definitely translate to the academic improvement as well."

All participants shared what was going well while teaching kinesthetic and tactile activities in virtual settings. They mentioned that the availability of online resources with learning activities went well because they were able to use them right away. P2 and P3

commented that students being able to perform online tactile activities such as touching and manipulating words went well. P4 mentioned that kindergarten students accessed the virtual setting on the iPad, and by the time they reached the second grade, they were able to use a computer the first time, which they seemed to find enjoyable.

All eight participants mentioned that restructuring learning in virtual settings could provide positive outcomes. Before COVID-19, two or three students shared a computer in the classroom. When students transitioned to virtual settings, the school district offered a computer to each student, and they took it home. P5, P6, and P7 agreed that continuing the use of the following online resources in education can increase student engagement: Google Slides, TypingClub, i-Ready, Jamboard, Starfall, and Seesaw. Moreover, P1 noted that besides adapting materials, another helpful process was broadening the online learning experience:

> [Students are] going to perform just as well as in another school or another state as long as they are in the same grade level. It is not really what adapted materials they have … [it is] using multiple resources to get these children to completely know, the common core standards.

Learning from Experiences

All eight participants shared what was most difficult with using learning activities in virtual settings. All eight participants agreed that lectures tired out the students. At one time or another, students muted themselves. Sometimes, the screen seemed like a barrier. P3 and P8 mentioned that not being able to physically show students have to perform a learning activity was difficult. Furthermore, the participants stated that they experienced

students having background distractions during online sessions. P1 shared, " [At times] too many kids were in one room, or they're in a daycare center or something." Lastly, all participants stated that they realized that the learning platform was changing.

All eight participants mentioned student engagement was the most difficult experience. Additionally, P4 and P5 agreed that being attached to a small screen made it harder for some to focus during reading and comprehension. The difficulty could be resolved through learning activities. As P6 stated, "Movement activities are one of the things that engage the students." For restructuring learning for student engagement, P6 suggested, "Develop more collaborative online platforms that young, young children can use, not just the older children."

The participants shared various ways to improve future learning activities in virtual settings. They all indicated that students' future should include keyboarding. Another skill consisted of creating universal hand signals for online learning. All eight participants agreed that adult supervision and communication were essential. P1 suggested that while students learn online activities such as dance steps, "Children, each one teaches one." The participants who shared information seemed to have two items in common, communication and computer skills.

Summary

In Chapter 4, I introduced the setting and presented the participants' demographics. I explained the data collection process and reported data analysis procedures on the inductive thematic process of moving coded units to categories and creating themes. I reported the trustworthiness of the study and addressed the research

results. The research findings consisted of five themes from the data analysis in relation to answering the research question. I reported one key finding from each theme answer to the research question: (a) The participants chose in person learning with kinesthetic and tactile activities and adapted them for virtual settings; students took many short breaks, teachers rotated, and specialized staff taught learning activities, and online sessions consisted of shortened school hours; (b) the participants turned to software applications with learning activities, implemented Zoom for online sessions, and used hardware appropriate for student motor skills; (c) the participants created new lessons to replace learning they could no longer teach in person; they asked for parental support to pick up the manipulatives for home use that supported kinesthetic and tactile activities in virtual settings; (d) the participants implemented various of kinesthetic and tactile activities to support student engagement in virtual settings; and (e) the participants experienced difficulties and processes that went well, and presented opportunities to improve future learning. In Chapter 5, I will address an analysis of the interpretation of the findings. Then, I explain the study's limitations, suggest recommendations for future research, and provide implications for potential positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative study was to explore primary teacher experiences with implementing innovative kinesthetic and tactile learning in virtual settings. Exploring kinesthetic and tactile learning in virtual settings for primary grades might increase an understanding about improving future kinesthetic learning activities for primary students. A purposeful sampling of eight primary teachers who transitioned to or implemented kinesthetic and tactile activities in virtual settings during COVID-19 participated in the study. Their interviews contributed to the limited literature available on creating learning activities in virtual settings. The study focused on one research question: What are primary teacher experiences with implementing kinesthetic and tactile learning in virtual settings?

Based on data analysis, I organized five key findings for the research question: (a) The participants chose in person learning with kinesthetic and tactile activities and adapted them for virtual settings; students took many short breaks, teachers rotated, and specialized staff taught learning activities, and online sessions consisted of shortened school hours; (b) the participants turned to software applications with learning activities, implemented Zoom for online sessions, and used hardware appropriate for student motor skills; (c) the participants created new lessons to replace learning they could no longer teach in person; they asked for parental support to pick up the manipulatives for home use that supported kinesthetic and tactile activities in virtual settings; (d) the participants implemented various of kinesthetic and tactile activities to support student engagement in

virtual settings; and (e) the participants experienced difficulties and processes that went well, and presented opportunities to improve future learning.

Interpretation of the Findings

Teacher experiences with implementing kinesthetic and tactile learning in virtual settings were viewed through the literature review and the conceptual framework, consisting of theorists Dewey's (1938, 2009) pragmatic constructivism theory and Siemens's (2005) connectivism interaction theory. The study might generalize to other primary virtual settings; however, qualitative studies are usually not designed for generalization (Patton, 2014). The specific selection criteria allowed rich information data from the purposeful sample. Some of the findings from this study confirm, disconfirm, or extend the findings from the literature. I interpreted these results in relation to each theme of the five key findings.

Kinesthetic and Tactile Activities Chosen for Virtual Settings

The key finding related to this theme was the participants chose in person learning with kinesthetic and tactile activities and adapted them for virtual settings; students took many short breaks, teachers rotated classes to help other teachers, specialized staff taught learning activities, and online sessions consisted of shortened school hours. The participants continued to support learning with kinesthetic and tactile activities when they transitioned to virtual settings. The traditional curriculum for face-to-face primary learners included highly kinesthetic and tactile activities (Bøg et al., 2021; Perdaniama, 2021; Sarouphim, 2021; Stamm et al., 2021). Teachers often layer these activities to create a strong topic foundation (Schukraft, 2020). This study confirms Farrell and

Stanclik's (2021) findings that indicate their participants also adapted kinesthetic activities in virtual settings and noticed the opportunity to rethink the lessons. The teachers also in this study adapted kinesthetic and tactic activities to use with Zoom so students could see the screen, which extends Farrell and Snacklik's findings indicating that their platform was not designed to allow much physical movement.

The teachers in this study were able to purposefully use movement in the virtual classroom during school closures due to the COVID-19 pandemic disconfirming the Meda and Mohebi (2021) results, indicating that teachers incorporated less kinesthetic activities. Teachers in this study allowed students many short breaks for physical play. Students did not play together but went outside to play or stepped away from the computer.

This study's results show that the participants indicated that they adapted kinesthetic and tactile learning processes from in person to virtual settings for primary students, which no one discussed in the literature review. Some school districts hired specialized staff who provided students with online instruction log in to do music, dance, and PE. Some teachers rotated to teach other online classes. Additionally, the PE staff sent materials home, such as jump ropes or soft foam balls. Some primary teachers added common sign language terms understood to improve learning engagement in Zoom.

Technology Chosen for Primary Learners

The key finding related to this theme was that the participants turned to software applications and teaching platforms, implemented Zoom for online sessions, and used computer hardware appropriate for student motor skills. The primary students were

familiar with the use of iPads and laptops from watching how their parents accessed them. Their use of electronics supporting learning in virtual settings extends Bird's (2020) findings that studies are needed to show how electronic devices support learning and play. In this study, teachers and students experienced real-world use of electronic devices rather than children's imaginative play with technology. Moreover, touchscreen technology might provide more age-appropriate learning than a desktop, which confirms the findings of Yadav et al. (2023) that touchscreen technology may align better with students' lack of fine motor skills. The teachers chose interactive software, such as GoNoodle and other interactive learning platforms. Their choice of software confirmed Nikolopoulou's (2022) research that teachers' choice of software should be interactive to improve learning in virtual settings.

All eight participants were accessing Zoom for synchronous video conferences. They used Zoom break-out rooms for groups and for teacher and student one-on-one time, which extended the findings of Elisavet's (2021) study that primary teachers have not commonly used break-out rooms for preschool and kindergarten, and the author suggested that for a future study. All participants in the study used break-out rooms for students to interact with each other and improve their social skills.

Teachers in this study stated that students became bored while learning in virtual settings. This finding, confirmed by Meda and Mohebi (2021), indicated that young children needed something that grabbed their attention when learning online to avoid boredom. Their participants also used various software programs to keep students

engaged; they suggested that online learning was hard without play and that students could improve learning and perform better through kinesthetic activities.

Teachers Adapted Lessons

The key finding related to this theme was that the participants created new lessons to replace learning they could no longer teach in person, and they asked for parental support to pick up the manipulatives for home use that supported kinesthetic and tactile activities in virtual settings. They performed time-consuming tasks such as scanning documents unavailable online, gathering manipulatives to send home to use during the Zoom session, and reaching out for parental support for school pickup. Teachers continued to use manipulatives, the same as in person. The use of manipulatives was confirmed by the findings of Rostan et al. (2021) that manipulatives or teaching aids involved students using kinesthetic and tactile activities for learning. The Munajah et al. (2022) findings extend the study by indicating that teachers adapted lessons by getting teaching materials to elementary students to assist in digital storytelling learning activities in virtual settings. This study was an extension of the Munajah et al. findings because the primary teachers also sent home tangibles to support learning activities in virtual settings. This study's results also extend the findings from Ameer and Parveen (2023), indicating that students experienced less hands-on learning in virtual settings. The participants of this study transitioned from in-person centers to virtual settings by accessing Zoom conferencing to review what they learned by using instructed hands-on activities with manipulatives and physical activities such as getting up and moving.

The teachers in this study collaborated with parents to improve parent and teacher involvement in supporting student learning and class management in virtual settings, which confirms the findings (Meda & Mohebi, 2021). The essential role of parental support in virtual settings was also confirmed by the findings from (Nikolopoulou, 2022) that showed that parent and student participation improved learning. Lastly, a teacher suggested using another video conferencing software besides Zoom, indicating that Microsoft Teams might be a better choice. This statement confirms the finding by Meda and Mohebi (2021) that Microsoft Teams is another possibility.

Student Engagement

The key finding related to this theme was the participants implemented a variety of kinesthetic and tactile activities to increase student engagement in virtual settings. This finding confirmed Fiş Erümit's (2021) study that showed that instructors provided multiple ways to communicate their curriculum during school closures of the COVID-19 pandemic. This finding also confirmed Hasbrouck's (2021) finding that a combination of kinesthetic and tactile activities with different learning online platforms or software programs can increase student engagement and knowledge transfer for kinesthetic and tactile learners in virtual settings. The research confirmed Spezini's (2021) findings that primary students should continue learning with multisensory strategies and that this study's participants confirmed that they were doing that and believed it to be successful.

The teachers in the study shared that under their instruction, kinesthetic and tactile activities increased student engagement; otherwise, some students stared at the screen. The teachers were always present to provide structured learning activities during online

sessions. The teachers motivated students through singing during synchronous learning for phonemic awareness, which confirms Spezini's (2021) findings that instructor presence with learning activities increases learning engagement.

The teachers in this study implemented kinesthetic and tactile activities to motivate student engagement and knowledge transfer, which confirms findings from Spezini (2021) that instructors modeling kinesthetic and tactic activities in virtual settings asked students to use whole physical movement to support student engagement and to new knowledge. The teachers in the study experienced that maintaining student engagement was hard for primary students. They were either distracted or fell asleep. Their experiences were confirmed by the findings mentioned by Stamm et al. (2021), indicating that the COVID-19 pandemic disrupted learning, and teachers urgently transitioned to virtual settings and were challenged to maintain student engagement and confidence in learning comprehension.

Opportunities

The key finding related to this theme was participants experienced difficulties, expressed what processes went well, and presented an opportunity to improve future learning. The experiences created ideas to improve learning activities in virtual settings. This finding was confirmed by the Elisavet (2021) study stating that online teaching can be perceived as an opportunity or an ordeal, depending on the preparedness for online teaching and learning.

A key finding in this study indicated that all eight participants stated they had opportunities to provide input to improve learning in virtual settings. They took

opportunities to adapt or modify lessons from in person to virtual settings to include kinesthetic and tactile activities. They ensured online presence during students' Zoom break-out room sessions by joining in and allowing students to see that they checked on them. The participants ensured that students were okay interacting with others in the break-out rooms. Teacher presence in break-out rooms extends the study of Elisavet (2021), who stated that future studies should include the use of kindergarten break-out rooms because peer collaboration should start at an early age.

The finding is that teachers are taking the opportunity to show their presence by observing that students are actually learning. They found that the most outspoken students were not necessarily the best at distance learning which might be due to accountability. This observation extends the findings of Akojie et al. (2022), who indicated that economic status, culture, or learning style might be the problem instead of behavior.

Teachers showed their presence in virtual settings by interacting with students to motivate student learning. The findings show that most teachers did find opportunities for students to practice social skills. Additionally, many took the opportunity to create new lessons and search for software. The teachers got to learn more about iPads and laptop functions. They also took advantage of options, such as participating in sending materials home. Instructors taking opportunities confirmed findings by Karcher et al. (2022), who indicated that instructors should purposely plan activities and learning opportunities to maximize learning in virtual settings. It also confirmed findings from the Nikolopoulou (2022) study, which found that UNESCO (2020) guidelines suggested that the COVID-

19 pandemic created opportunities to rethink learning. All eight participants mentioned that they adapted or created new lessons in virtual settings. They took the opportunity to apply kinesthetic and tactile activities to motivate learning. My study confirmed the research by Karcher et al. (2022), who stated that the educational challenges caused by school closures opened opportunities for teachers to reflect on the pedagogy that engaged students.

Interpreting the Findings in the Context of the Conceptual Framework

A combined conceptual framework of Dewey's (1938, 2009) pragmatic constructivism theory and Siemens's (2005) connectivism theory supported this basic qualitative study. I selected their contextual lens to explore primary teacher experiences with implementing kinesthetic and tactile learning in virtual settings to increase understanding about students' ability to learn with kinesthetic and tactile activities. The combined conceptual framework consisted of two themes from the literature review, Dewey's active learning and Siemens's connectivism.

Dewey's Active Learning

Dewey's (1938, 1915) ideas on active learning focused on students as active participants throughout their education. Dewey's (1938) pragmatism theory provided a framework for guiding the interviews (Patton, 2014). Students excel while learning when they experience and interact with the curriculum. Dewey's theory also suggests that learning comes from experience. Dewey's transformation theory called for removing the learning limitations of early childhood learners to improve social skills and academic growth. He suggested that the curriculum constantly changes during a child's educational

journey. Dewey (1915) explained that active learning does not replace learning materials. He suggested that active or hands-on learning is a better alternative to listening. The physical body requires active experiences for learning and personal growth (Dewey, 1915). Active learning keeps students' attention and interest.

In the literature review concerning active learning, Viana and Peralta (2021) stated that Dewey's learning theories valued a student-centered curriculum that includes learning activities. One of Dewey's beliefs about traditional learning was that education ignored learning processing (Tan, 2020). Dewey's education theories apply to learning and social skills outside the classroom (Winstanley, 2018).

The data in this study confirmed Dewey's ideas of active learning that students learn from experience. Kinesthetic and tactile activities helped students to learn and remember content through instructional physical movement and touch. The conceptual framework supported that the curriculum might change during a student's education, which happened as teachers urgently transitioned to virtual settings during the COVID-19 pandemic. Teachers in this study adapted lessons from available resources and added manipulatives for learning by doing. They used hands-on activities during instruction learning centers while in Zoom. In the centers, students could collaborate or work individually to practice what they learned, allowing students to learn through social skills.

The teachers' knowledge of social and intellectual theories for primary students involved them knowing that they were part of a bigger picture, which helped them realize that in person learning had to change to learning in virtual settings in their students' education due to school closures caused by the COVID-19 pandemic. The teachers

included activities as they pivoted their curriculum to virtual settings because they knew that activity is a characteristic of primary students. The teachers integrated software programs with learning activities for student engagement. The teachers centered learning holistically by sharing that they included kinesthetic and tactile activities in virtual settings to help students understand and apply learning to other surroundings or circumstances.

Siemens's Connectivism

Siemens's (2005) connectivism theory embraces learning in the digital age. This theorist raised awareness of the rapidly growing field of online knowledge and the quickly changing, altering information development. Technology improvements should meet students' learning activities (Siemens, 2005). Siemens's connectivism theory comprised eight basic principles. I applied one of the principles to this study, *Learning and knowledge rests in diversity of opinions.* The principle applies to my study because the participants made digital choices about their students.

In the literature review on active learning, Malkawi and Khayrullina (2021) found connectivism supportive of the rapid digital world changes that changed learning processes, communication, and lifestyles. Siemens' connectivism theory suggests that students have connections for learning, and they experience knowledge within their learning environment (Zambrano & Campuzano, 2020). Dewey's (1915) constructivism connected teachers with students, and Siemens built upon the theory by stating that students should also connect to technology (Hariri et al., 2023). Ramkissoon et al. (2020) stated the connectivism theory helped researchers and teachers conclude that the e-

learning platform should meet the requirements and expectations of the students. As UNESCO (2020) suggested, active learning should resemble traditional learning in a virtual setting. Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through Siemens's (2005) connectivism theory, indicating the idea of a shifting reality. While there is a correct answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

The data in this study confirmed Siemens' ideas of connectivism that the participant's rapidly changing society affected and changed learning processes. Although the learning platform shifted to virtual settings, the teachers still required students to participate in kinesthetic and tactile learning. Furthermore, the instructors continued social networking for students by opening Zoom break-out rooms to allow them to connect with each other and with the teacher.

The teachers knew they could share various experiences to improve learning during the COVID-19 pandemic. The teachers faced the reality that some students were already connected to online networks and had different backgrounds, physical learning spaces, and parental support. In the virtual settings, teachers selected software, learning activities, and manipulatives; and used electronic devices and Zoom with break-out rooms. Those digital learning tools included software featuring arts, music, and physical movement to assist students in learning phonics and math. The participants shared that digital play was more appropriate for second-grade students and higher.

Limitations of the Study

Several limitations could have impacted the outcome of the study. The participants were not from a specific population. The benefit was that they gave the study a diversity of opinions and experiences. However, the study consisted of a small sample of participants. The benefits gained were that they provided rich information. I incorporated a preliminary review to add rigor to the design.

The time for recruitment might have caused barriers to the study. Many primary teachers have already returned to in person teaching. They are now teaching in person or a blended learning curriculum.

The participant selection consisted of the openness of my connection to the study. My lack of interviewing experience might impact interviews and data analysis because I was a novice researcher. To overcome these limitations to the interview process, I created an interview protocol with probes. The research interview probes, warm-up questions, and debriefing helped to obtain rich information and reveal authentic answers proving accurateness towards content and the data sources. My biases in the study might have caused limitations, although I had procedures in place to ensure that my role as a researcher remained unbiased by adding a reflective research process within the audit trail listing.

Recommendations

Recommendations for further research are based on study results and limitations. The first recommendation is related to the study' findings concerning the types of kinesthetic and tactile activities and software chosen for virtual settings for primary

students. Future research should extend to other grade levels to explore teacher experiences using kinesthetic and tactile strategies while teaching online. Also, future research should explore how primary teachers use learning software and how they self-assessed their modified lessons.

The second recommendation is related to this study's findings concerning how teachers took action when they realized they were experiencing disrupted learning caused by the COVID-19 pandemic. In the literature review, some teachers shared their curricula and technology (Akojie et al., 2022). They looked upon disrupted learning as an inevitable change to which instructors should recognize and embrace the opportunities. In the study, teachers collaborated with parents and students to ensure class management and that students had manipulatives. More research should consider how primary teachers continue improving kinesthetic and tactile activities in virtual settings. I also recommend comparing primary students' ability to learn with kinesthetic and tactile activities in virtual settings with in person learning to understand the differences that can improve learning activities.

The third recommendation is related to the study's findings concerning student engagement. When students attended specials or break-out room activities, many did not return. I recommend a study on teachers' experiences with children with parents that have full-time jobs to encourage students that they are not alone. The outcomes might motivate students doing virtual learning activities to attend and participate in all online sessions.

Implications

In this section, I will describe the potential impact for positive social change at the individual, family, organizational, and societal levels. First, at the individual level, results from this study may encourage primary teachers to ensure their curriculum include kinesthetic and tactile activities to motivate young learners in virtual settings. The results also might provide practical strategies for implementing kinesthetic and tactile activities while continuing or returning to learning in virtual settings.

There is also potential for change at the organizational level, which could be pursuing professional development opportunities that support primary teachers and learning the latest teaching techniques and new technology for primary students learning in virtual settings. Professional development could help teachers better meet students' learning and remembering. Professional development can happen when teachers participate in parental support activities. Professional development might be held during staff development time, or when teachers are visiting other classrooms. It can also happen while reading literature about education, and by conducting individual research.

This study may also advance knowledge in the field of learning instruction and innovation because teachers can learn to help primary students who are holistic learners by transforming learning activities into creating educational projects. Fun activities can create positive experiences and memories that increase learning and remembering. The research suggests implementing various kinesthetic and tactile activities to see how students respond to them and could build an understanding of what activities work best for the virtual settings class.

This study may have positive implications based on the finding; that teachers took action. The conceptual framework states that the curriculum will change during a student's educational journey (Dewey, 1938, 2009). Siemens's (2005) connectivism theory defined the role of the student as dynamic and embraced learning in the digital age. This result suggests that continuing to create a curriculum in virtual settings that include kinesthetic and tactile activities might improve the types of learning activities that decrease boredom within online learning. This study may also encourage research about parental support for student study spaces accommodating kinesthetic and tactile activities in virtual settings as well as provide ideas for restructuring online learning so students will not think they are learning alone.

A contribution that this study makes to positive social change is in relation to improving professional practice, a change in the way teachers approach learning for primary students. The results from the study suggest continuing to include kinesthetic and tactile activities in virtual settings for primary students. These activities can increase learning within a school district's reduced hours for teaching and learning during video conference sessions. If teachers continue implementing kinesthetic and tactile activities in virtual settings, the students learning with these activities might include them in continual learning. Moreover, as adults, students could later apply kinesthetic and tactile activities for self-efficacy, to help family and friends, and to increase success in their educational and professional careers.

Conclusion

Kinesthetic and tactile activities integrated into virtual settings created another learning path for primary students to improve learning, remembering and student engagement during the COVID-19 pandemic. The problem related to this study was that the COVID-19 pandemic caused disrupted education. UNESCO (2020) published a teachers' guide for online learning using multimodal and multisensory activities. The purpose of this qualitative study was to explore primary teacher experiences with implementing innovative kinesthetic and tactile learning in virtual settings. Exploring kinesthetic and tactile learning in virtual settings for primary grades might increase an understanding about improving future kinesthetic learning activities for primary students. Based on data analysis, I identified five key findings for the research question: (a) The participants chose in person learning with kinesthetic and tactile activities and adapted them for virtual settings; students took many short breaks, teachers rotated, and specialized staff taught learning activities, and online sessions consisted of shortened school hours; (b) the participants turned to software applications with learning activities, implemented Zoom for online sessions, and used hardware appropriate for student motor skills; (c) the participants created new lessons to replace learning they could no longer teach in person; they asked for parental support to pick up the manipulatives for home use that supported kinesthetic and tactile activities in virtual settings; (d) the participants implemented various of kinesthetic and tactile activities to support student engagement in virtual settings; and (e) the participants experienced difficulties and processes that went well, and presented opportunities to improve future learning.

A better understanding of how primary teachers used learning software and self-assessed their modified lessons, ensuring the curriculum included learning activities might encourage more teachers to consider being prepared in advance of another education disruption. Primary teacher experiences providing kinesthetic and tactile activities equip students for continual learning regardless of the types of learning platforms and study spaces where they find themselves.

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Appendix A: Interview Protocol

Research Title: Primary Teacher Experiences With Kinesthetic and Tactile Learning in Virtual Settings

Warm-up Question: Before COVID-19 and virtual learning, can you please tell me how you used kinesthetic and tactile activities for your students?

Interview Questions

1. What actions did you take when you realized that you had to transition or implement kinesthetic and tactile activities (learning with motion) in the classroom to virtual settings during the COVID-19 pandemic?

   1a. What were your challenges?
   1b. How did you solve the challenges?

2. What was your experience with limited time and possibly limited resources while transitioning or teaching with kinesthetic and tactile activities in virtual settings during the COVID-19 pandemic?

   2a. What support resources did you have?

3. What were your teaching alternatives to kinesthetic and tactile activities in virtual settings?

   3a. What was your experience using the alternatives?
   3b. If you did not use or had no alternatives, what did you do, for example, apply do-it-yourself tactics?

4. What were the students' kinesthetic and tactile activities in virtual settings?

   4a. Tell me more about the types of activities.
   4b. What physical movements did they use in virtual settings?

5. In your view, how do you think digital play improves hands-on activities?

   5a. What did the students do during digital play?
   5b. How did digital play help students comprehend information?

6. I understand that some parents kept their children at home or put them back into preschool. What were the students' challenges with participating in learning activities in the virtual settings?

7. How did kinesthetic and tactile activities help improve holistic learning in virtual settings?

   7a. Tell me about a typical day while teaching in virtual settings.
   7b. What is an example of learning activities in academics?
   7c. What is an example of learning activities in social skills?

8. What do you need right now to improve learning activities in virtual settings?

9. What part of learning activities in virtual settings is going well?

10. What is the most difficult part of teaching learning with movement activities in virtual settings?

11. What is your opinion of the best way to improve future learning activities in virtual settings?

Closing the Interview: Is there anything else you'd like to share with me before we finish this interview? Thank you for participating. Your contribution will help future learning for primary students.

Opening		This interview aims to talk about the primary teacher experiences with the challenges of transitioning to a virtual setting during the COVID-19 pandemic. The information is important because it can help improve future learning activities in virtual settings. The goal is the fill a literature gap concerning the challenges teachers face while implementing learning activities. The interview should take between 30-and 45 minutes. I will send you a review of the preliminary findings via email. This review is called a member checking. I will member-check with each participant. Member checking involves sharing my interpretation of the interview with participants so they can confirm whether I am accurately representing what they meant to say. Your identity is confidential. If you have any questions about why I am asking something, please feel free to ask me. You can choose to stop this interview at any time. I will record this interview for transcription purposes for the study's data analysis. You are in a great position to share your experiences and knowledge. I will combine all the answers from the interview to perform the data analysis. Your contributions will remain confidential and not identified with you. Do you have any Questions? Are you ready to begin?
Warm-up, Not related to the interview	Not Related to framework	Do you have any questions about the research? Do you have questions about participating?
Warm-up, Not related to the interview	Not Related to framework	Do you have any questions about the significance of the study?

Debriefing

Thank you for participating in this interview process. Your participation is confidential and voluntary. Thank you for participating in this interview process. I will provide you a copy of your transcript and member check of your interview and a summary of the dissertation after publication.

Appendix B: Codebook

Code (Number of codes)	Codebook: An explanation of each code
Accepting what was happening (44)	Acceptance is realizing that the sudden change to teaching and learning in virtual settings might include challenges and solutions in learning in education. Dedicated to learning, teachers adapted or created new lessons for learning activities in virtual settings.
Arts and Music (24)	Arts and music were kinesthetic, physically moving to music for learning. Students actively learn by doing rather than seeing and hearing the music. For example, students learned through alphabet songs, arts, music and movement, singing, and rapping.
Attendance (26)	Attendance included system login and keeping the screen on as instructed. It included returning to the home teacher after attending specials, such as music or PE. For example, students did not always come back to their teacher after a break-out room session.
Breaks (16)	Virtual learning included short breaks. Body breaks consisted of stepping away from the computer. Examples were playing outside and taking frequent recess. Virtual breaks included staying online with instructional activities from software applications. For example, doing a GoNoodle. Playing video games were not breaks.
Creating media (4)	Many prints were not online. Instructors scanned, uploaded, or put them into programs. Instructors created videos, imagery and music. For example, when instructors could not find books online, they scanned them. Instructors made music videos for active learning.
Digital Play (16)	Digital play were computer games and mobile technologies. Digital play involves active learning and online interacting. For example, most students learned to type with TypingClub software in the second grade to learn the keyboard for the next grade level.
Hands-on activities (learning through Zoom) (19)	Tactile involves hand movements or hands-on activities by moving as instructed. For example, Zoom instructional hand movements include clapping, cutting, and sliding fingers to move phonemes.

Code (Number of codes)	Codebook: An explanation of each code
Hands-on activities (touch screen) (7)	Tactile involves hand movements or hands-on activities on the touch screen. For example, the instructors made learning fun by implementing interactive software involving hand movement to drag and drop the animated animals in their correct living environment.
Hardware (32)	Primary students in the study learned the iPad, Mac, laptop, mouse and screen commands. School districts sent home this technology for learning in virtual settings.
Improving future learning (27)	Take steps to motivate and create goals for online learning activities for primary students. For example, primary teachers translated learning activities into virtual settings during the COVID-19 pandemic.
Improving learning activities (29)	Improvements included focusing on social skills, adult supervision, playing together, hands-on activities, teaching platforms, selecting the best schedule for students in virtual settings, and creating study spaces. For example, in a COVID-19 pandemic virtual setting environment, students learned phonics on the platform or by accessing software applications.
Learning and retaining (10)	Learning and retaining involve the same learning activities applied consistently for long-term memory.
Modifying activities for the screen (18)	The participants modified lesson activities so students could see them on the screen.
Modifying lessons (12)	Modifying, and developing lessons by adding more learning activities as they transitioned or implemented kinesthetic and tactile activities in virtual settings.
Most difficult (29)	Participants shared their most difficult experiences with learning in virtual settings while implementing learning activities. For example, one of the most difficult was needing more space or the proper participation area.
Parental support (33)	Parental support for online learning included different tasks than in person learning, such as communicating with teachers about picking up school supplies, providing study space, or learning about the virtual setting platform and software. Some parents helped their children during online sessions, and others had to work outside the home. The COVID-19 pandemic suddenly changed their daily work routines.

Code (Number of codes)	Codebook: An explanation of each code
Physical movement (41)	In virtual settings, students could either get up, stand, sit, or move. Some of the activities were identical to in person education. The participants included physical activities within software and learning platforms.
Phonics (12)	The teachers taught letter sounds through phonics songs in Zoom and from software applications, such as Zoo-phonics. Furthermore, they accessed software applications for teaching digraph chants and phonemes.
Reaching out (46)	Instructors reached out for parental support. The teachers also reached out to support each other. Reaching out included motivating students, but also calling them out to obtain class management.
Scheduling (22)	The schools set a start and finishing time for learning in virtual settings. The schedule was usually much shorter than in person learning. The average virtual setting sessions were two and one-half hours. Some teachers rotated classes during the shortened online school hours. Scheduling also included time for pickup materials days and making time for self-learning.
Sending home materials (19)	The participants sent home items to help students learn in virtual settings. They mentioned that oftentimes, students misplaced their books. Material examples were math papers, Play-Doh and even technology such as hotspots for internet access.
Sign language (5)	During virtual setting sessions, American Sign Language (ASL) and hand signals helped provide direction or quiet the class. Examples are the Me-Too symbol and hands-on tracing letters.
Social Skills (8)	Students interacted with each other in virtual settings, but they were not as spontaneous as in person. For example, the participants used the break-out rooms to help students socialize. Students turned on their mics to socialize with each other.
Software (114)	The participants provided names or described software learning programs accessed in virtual settings. Some description samples were math and motion, and computer programs.
Tangibles for learning activities (22)	Tangibles are real-life materials and manipulatives, playdough or Play-Doh, counters, buttons, base 10 blocks or pattern blocks, cut-outs and rulers. For example, participants used base 10 blocks to support addition and subtraction.

Code (Number of codes)	Codebook: An explanation of each code
Video Conferencing (23)	Zoom and Microsoft Teams were the video conferencing platforms that participants mentioned in this research. For example, software features such as break-out rooms and screen sharing enhanced learning in virtual settings for using tangibles.
What is going well (5)	What is going well describes how well students receive learning activities in virtual settings. For example, students who seemed introverted during in person learning seemed to excel in virtual settings.