EXPLORING TEACHERS' PERCEPTION AND USE OF WHOLE BRAIN TEACHING: A HERMENEUTIC PHENOMENOLOGICAL STUDY

by

Tiffany Amber Jay-Claycomb

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

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Abstract

The purpose of this hermeneutic phenomenology study was to understand Whole Brain Teaching (WBT) through the experiences and perceptions of teachers who utilize this system in the United States. The theory guiding this study was George Miller's information processing theory, which identified how information is attained, stored, and retrieved, a foundation of the WBT system. This study attempted to answer the central research question: What are the perceptions of classroom success for teachers who use WBT systems? This qualitative hermeneutic phenomenology research focused on WBT teachers across the United States, contacted through an online platform. Data collection consisted of interviews, journal prompts, and focus groups. Holistic, selective, and detailed reading approaches were applied to all transcribed data, and then data was triangulated using conceptual analysis. The themes extracted from the data were the transformation in teaching and classroom dynamics with WBT, the influence on academics and behavior management with WBT strategies, and personal growth and professional fulfillment. The findings indicated that teachers' experience with WBT has had a significant positive transformation within their classroom, including behavior and academic growth, by enhancing connections while utilizing fun strategies. This study's significance was to add to the available literature that examined the experiences of WBT teachers.

Keywords: Whole Brain Teaching, brain-based learning, information processing theory

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Dedication

I dedicate this dissertation to all who have influenced my life and path, showing my creator's love and lessons. Thank you, Father, in Jesus’s name!

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List of Abbreviations

Cross-cultural, Language, and Academic Development (CLAD)

Information Processing Theory (IPT)

Institutional Review Board (IRB)

Language Essentials for Teachers of Reading and Spelling (LETRS)

Teaching English to Speakers of Other Languages (TESOL)

Whole Brain Teaching (WBT)

CHAPTER ONE: INTRODUCTION

Overview

Biffle (2023) stated, “You’re a teacher. Grow, learn, transform yourself, or die by ossification. If you’re afraid to try new teaching techniques, you’re petrifying yourself to death” (p. 19). Whole Brain Teaching (WBT) can aid educators in the growth of their teaching methods. WBT enables teachers to engage students in lessons and strategies centered on how a student’s brain learns best in a classroom environment. WBT is a system of various strategies that engage students emotionally and physically while requiring students’ usage of their senses (Biffle, 2023). This chapter relates the evolution of student learning and how students today must have classrooms that engage all students in preparation for the future. The historical, social, and theoretical context of this problem is addressed. Next, a statement of the problem is discussed, noting the gap in the literature and the purpose of this study, which is to understand the phenomenon that guides this study. The perspective and interpretations of teachers who utilize WBT are the basis of this hermeneutic phenomenological study. The theoretical, empirical, and practical significances are discussed. Finally, the research questions and definitions are provided.

Background

Over the years, teachers have structured many diverse teaching methods to aid student engagement and motivation toward learning. Educational curriculum and instruction platforms have continuously evolved from Montessori's learning model to Skinner's behavioral approach (Whitescarver & Cossentino, 2008). This background section explores the historical, social, and theoretical contexts that have shaped pedagogical strategies, focusing on brain-based learning and its relation to education today.

Historical Context

Various teaching strategies have been developed to improve student engagement, academics, and motivation. In the early 20th century, Maria Montessori created the Montessori Method, centered on a hands-on learning model (Scott & Myers, 2021). Scott and Myers explained that Montessori students work through the curriculum using hands-on materials and engage with classmates and teachers, where they also learn to regulate their behaviors. In the mid-20th century, B.F. Skinner discovered conditioning or operant learning, which analyzes behavior and environmental conditions (Schlinger, 2021). In classrooms, Skinner's behavioral approach, which utilized rewards and punishments to shape behavior, was widely used. Criticisms of Skinner's behavioral approach were made because critical thinking and creativity were lacking. Schlinger indicated that the study of cognitive processes within education gained momentum in the mid-20th century. Utilizing the study of cognitive processing promotes students' individuality and a need for personalized instruction . Piaget (1972) noted the importance of understanding students' thinking processes.

Teachers utilizing the constructivist approach in the late 20th century emphasized the students constructing their own knowledge (Vygotsky, 1978). Constructivism notes that obtaining knowledge is a social construct that allows students to engage, explore, and reflect. Piaget (1952) asserted that the discovery of one's own world is necessary for children, and they must be able to have an environment that provides purposeful interaction opportunities. Jensen (2005) indicated that for neurons in the brain to create strong connections, there must be exposure to interesting, challenging, or exciting types of stimulation. The 21st century has shifted to educational strategies that focus on brain-based learning (Jensen, 2005).

Brain-based learning evolved in the late twentieth century as academics investigated how the brain receives and stores information (Jensen, 2000). Brain-based learning is based on knowing how the brain functions and on customizing teaching strategies; accordingly, learning may be improved. According to brain-based learning theory, the brain is a dynamic, pliable organ that changes constantly in response to new experiences. As a result, educators should foster neuroplasticity, or the brain's ability to remodel and develop new neural connections (Wolfe & Nevills, 2004).

An experienced educator and educational consultant, Eric Jensen (2000) has played a vital role in advancing brain-based learning. Jensen's book *Teaching with the Brain in Mind* (2005) popularized the concept of brain-based learning while providing teachers with practical techniques and strategies. Jensen advocated for various approaches to improve learning, including using movement, emotion, and imagery. Jensen and McConchie (2020) noted the importance of teachers utilizing teaching methods that aid with learning new concepts to different sections of the brain to assist the memory consolidation process. Engaging various parts of the brain, such as the visual, audio, and motor cortex, can aid students in better understanding the topics.

John Medina (2008), a molecular biologist and author of the book *Brain Rules,* is another significant person in the subject matter of the brain. Medina's work highlights the necessity of understanding how the brain processes information, and he offers 12 guidelines for educators to follow based on current neuroscience research. Among these principles are the utilization of multimodal techniques, the engagement of emotions, and the provision of constant feedback. Teachers can aid students' ability to maintain and make long-term memories more

reliable by incorporating new learning gradually and repeating it in timed intervals . By understanding Medina's guidelines, teachers can help students meet today's learning standards.

As technology has enabled more profound research of the brain's inner workings, brain-based learning has become popular in recent years (Goswami, 2006). Nevertheless, some educators and scholars are suspicious of the technique, claiming it is not supported by substantial scientific data. The history of brain-based learning demonstrates a movement in emphasis from behaviorism and cognitivism to a more holistic view of the brain and how it impacts learning (Jensen, 2000). While not without debate, brain-based learning has provided educators with valuable insights on how to design effective learning environments.

Social Context

Classrooms today must prepare students for the advancements of the 21st century by ensuring students are well-versed in a variety of skills. The skills that students need in the future are rapidly changing, and schools today struggle to match the needs of the future (Rahman, 2019). The federal requirements in the Every Student Succeeds Act (ESSA) ensure that states have adopted challenging, college-and-career-aligned standards in reading, math, and science across all grades with at least three proficiency levels (Duff & Wohlstetter, 2019). Meeting all students' academic needs requires teachers to maintain student engagement (Jensen, 2000).

Neuroscience has merged into educational research and practices within the last few decades, ultimately aiding teachers in designing lessons to help student engagement (Jensen & McConchie, 2020). Lalancette and Campbell (2012) noted that with educational neuroscience research, various improvements in attentiveness, abstract concepts, and other educational advancements can occur. Jensen and McConchie (2020) express that brain-based education is learning the way the brain learns best. Brown et al. (2014) explained that learning and memory

are based on neural processes that require retrieval practice, spacing, rehearsal, rule learning, and utilizing mental models, which can all be incorporated into how students engage within a classroom.

Attention and student engagement are significant factors that affect students' learning in classrooms today. Teachers must plan lessons that maintain student engagement and promote active participation. Incorporating consistent methods into classroom management and daily routines can help engage students and keep them attentive. To help students meet state standards and prepare for college, teachers must understand the experiences of others who have utilized strategies designed to address the whole child, promoting academic growth and character development (Duff & Wohlstetter, 2019). Research on WBT can provide valuable insights into these strategies, their effectiveness, and how they can benefit teachers and students. Such analysis can help inform educational practices across the United States (Biffle, 2023).

Theoretical Context

The theoretical framework for this research is based on information processing theory. George Miller (1956) was a founder of cognitive psychology and introduced the theory of information processing (Çeliköz et al., 2019). Çeliköz et al. explained that Miller's studies are based on Edward Tolman's latent learning theory of no immediate reward or punishment when learning occurs. Miller researched memory capacity and identified *chunking*, which describes how the brain and short-term memory store information. Thomas et al. (2019) noted that educational policymakers pursue integrating cognitive neuroscience findings when making decisions for education.

Research conducted by Smith and Jones (2021) indicated that disengaged students may have a negative academic performance and need attention control and information processing

support. Educators can supply teaching strategies that include active learning to aid cognitive processing and limit disengagement. Chen and Liu (2022) discovered that cognitive teaching, compared to traditional teaching models, improved attention, engagement, and learning outcomes. Information processing theory is essential in understanding teaching strategies and methods in education. Gao and Zhang (2021) expressed that information processing theory-based cognitive and motivational systems in education promote students' learning in mathematics. Current research shows the validity of continued research connecting informational processing theory to teaching strategies and models, understanding how this aligns with teachers and students in classrooms today.

Problem Statement

The problem is teachers' inability to engage students in classrooms today and the ineffectiveness of teachers in cultivating a more profound learning experience. Teachers have specific timelines to teach state standards, and some students can be left behind in the fast pace of the classroom curriculum schedule (Hunt & Holmes, 2018). Teachers must engage all students effectively to aid their learning journey (Biffle, 2023). Sarker et al. (2023) explained that students in the 21st-century traditional classrooms have little interaction with peers and teachers; the traditional classroom model is where the students are the listeners. Traditional teaching methods often lack ways to capture students' interests that drive a sustained connection to learning, resulting in a need for different pedagogical approaches to engage students (Biffle, 2018).

Teachers can use various methods to engage students in their classrooms; however, positive, consistent processes must be in place (Çeliköz et al., 2019). Hunt and Holmes (2018) discussed how consistent lesson beginnings and endings are essential and can determine a

teacher's effectiveness. Elfiky (2022) expressed that WBT is an effective way for teachers to provide lessons that increase students' motivation. WBT is brain-based learning that integrates neuroscience into curriculum and instruction. Biffle (2018) stated that students learn when they participate in seeing, hearing, doing, speaking, feeling, and laughing. McTighe and Willis (2019) explained that brain-based learning strategies aid student growth and academic achievement. Brain-based strategies, such as multisensory, social-emotional, and experiential learning, are a foundation for successful teacher-guided strategies. Hunt and Holmes (2018) expressed that most new learning happens at the beginning and end of a lesson because students' brains filter all the sensory information input into the brain, holding onto the start and finish of a lesson. WBT applies many engaging strategies to activate the brain's prefrontal, motor, visual, limbic, Wernicke and Broca areas (Biffle, 2018). This study investigated teachers' perception and consistent usage of WBT, a brain-based learning strategy within the classroom. Research is needed to understand how teachers use WBT measures and perceive its effectiveness in classrooms. This study has highlighted the relationship between teachers' perceptions and the emphasis on utilizing WBT.

Purpose Statement

The purpose of this hermeneutic phenomenology study was to understand WBT through the experiences and perceptions of teachers who utilize this system in the United States. At this stage in the research, WBT will be generally defined as an instructional system. The theory guiding this study was informational processing theory (Miller, 1956).

Significance of the Study

Recognizing the WBT system and how it aids teachers in molding and perfecting their teaching practices is essential because the WBT system can be utilized in any classroom,

integrating neuroscience into curriculum and instruction to engage students in learning. By implementing the strategies of WBT, educators can create an engaging, interactive learning environment that enhances student participation levels and retention. Biffle (2023) stated that teachers should teach in a way the brain learns best. This study focuses on WBT teachers' perceptions and experiences using the system and is guided by the informational processing theory. The significance of this hermeneutic phenomenological study is explained through a theoretical, empirical, and practical perspective.

Theoretical

The theoretical significance of this study contributed to understanding how information processing theory applies to teachers using WBT in their classrooms. Information processing theory posits that learners process and encode new information based on prior knowledge and cognitive schema (Atkinson & Shiffrin, 1968). This study's findings can help teachers construct instructional practices that engage students to improve student engagement and academic outcomes. This study can aid in understanding how teachers interpret and make sense of their experiences with WBT, providing insights into how teachers adapt or adjust their teaching models to meet the needs of their students. The study examined whether teachers change or adjust their WBT use based on their student's cognitive processing, guided by the lens of information processing theory.

Empirical

The empirical significance of this hermeneutic phenomenology study provided a perspective on the problem of student engagement and how WBT affects student engagement and learning outcomes. Few studies have investigated the experiences and perceptions of teachers who use WBT, although previous studies have examined the effectiveness of WBT

(Elfiky, 2022). This study identified the underlying meanings and interpretations that teachers attach to their experiences with WBT, which provided valuable insights into advancing the operations of this teaching system in the classroom. Additionally, this study aided in understanding how teachers change or adjust their teaching strategies to match the requirements of their students. As Tsai and Tsai (2003) observed, effective teachers constantly monitor students' cognitive processes and alter their lessons accordingly. This study provided insights into effective teaching practices by studying whether and how teachers change or adjust their usage of WBT based on their student's cognitive processing.

Practical

The practical significance of this study impacted many stakeholders, including students, teachers, schools, and policymakers. When utilized consistently, WBT incorporates character education into daily activities, aiding students' attention on tasks (Biffle, 2018). Dao et al. (2021) found that teachers may need to be more cognizant of students' emotional side and interpretations of activities so students can proceed with tasks effectively. WBT revolves around teacher/student relationships and active classroom engagement (Biffle, 2013). Chang and Hall (2022) found the significance of developing teacher training that supports teachers in improving their growth mindset with students and adopting teaching methods that aid teachers in connecting with students to support their emotional needs. On a broader scale, this study generated knowledge to contribute to the nation by discussing the effectiveness of WBT and how teachers compare it to other teaching systems in promoting student engagement and learning outcomes.

Research Questions

Exploring the processes of WBT, this study gathered and decoded the range of perceptions and interpretations teachers accredit to their experiences with this pedagogical approach. The central research question and three sub-questions investigate the feelings of teachers' reflections, thoughts, and engagement with WBT. These questions provided insight into the WBT system and its influences in classrooms today.

Central Research Question

What are the perceptions of classroom success for teachers who use WBT systems?

Sub-Question One

How do teachers perceive the WBT system within their teaching method?

Sub-Question Two

How do teachers understand how the WBT system fits their students' needs?

Sub-Question Three

How do teachers perceive students' knowledge retrieval when utilizing the WBT system?

Definitions

1. *Brain-based learning* - The engagement of strategies based on principles known to be true about the brain (Jensen & McConchie, 2020).
2. *Information processing theory (IPT)* - Information is the basis of learning and is communicated through a sensory register and transferred to memory in the brain (Schunk, 2020).
3. *Whole brain teaching (WBT)* - A teaching system to increase student effort by rewarding for improvement versus ability in academic skills and social behaviors (Biffle, 2018).

Summary

The problem this study addressed is the ability of teachers to engage students with classwork in today's fast-paced world. The purpose of this hermeneutic phenomenology study was to understand WBT through the experiences and perceptions of teachers who utilize this system in the United States. This area of study is significant for all teachers because WBT is a teaching system that can be incorporated into any classroom. The WBT approach integrates neuroscience into curriculum and instruction to engage students in learning. Elfiky (2022) explained that WBT is an effective way for teachers to provide instruction that increases students' motivation. Current research does not explicitly address teachers' perceptions of WBT. Understanding teachers' perceptions and interpretations of the WBT system can aid teachers today and in the future by improving student engagement and learning outcomes.

CHAPTER TWO: LITERATURE REVIEW

Overview

This systematic literature review explores strategies and the role of whole brain teaching (WBT) in teachers' perceptions and usage of those strategies. This chapter reviews the current literature related to the topic of study. The first section discusses the theory relevant to WBT: information processing theory. Next, a synthesis of recent literature regarding neuroscience and learning and brain-based learning within curriculum and instruction as it relates to WBT. This review identified a gap in the literature about teachers' perception and consistent usage of WBT strategies and the relationship between this perception and the emphasis on WBT brain-based learning strategies in teacher classrooms.

Theoretical Framework

Grant and Osanloo (2014) explained that a theoretical framework is the foundation of a study, supporting the research's purpose, significance, and question. The theoretical framework for this research is based on information processing theory. Information processing theory (IPT) aids in understanding WBT and teachers' perceptions of using those strategies in the classroom (Atkinson & Shiffrin, 1968). The purpose of connecting information processing theory to WBT is because it specifically addresses the importance of the brain's part in learning (Biffle, 2023). Educators who implement WBT strategies incorporate IPT, which grounds the thoughts and ideas presented in this research, aiding in determining the results of data collection and interviews.

Understanding the mental representation process of thoughts encoded into the brain can aid teachers in creating a brain-friendly classroom (Logan, 2000). Another aspect to assist teachers in generating lessons and teaching strategies from IPT is the transference of knowledge

(Schunk, 2020). The transfer method has many implications within the classroom. WBT strategies directly address the process of transfer (Biffle, 2018). For example, students who turn to a partner and explain or paraphrase new information while using hand gestures utilize multiple regions of the brain to speak, listen, and use motion (Biffle, 2023). Utilizing hand gestures and physical motion is a WBT brain-based strategy to aid with encoding information initially stored in the short-term memory and then transferring that information into long-term memory using the whole brain. Another example of encoding information is a teacher engaging students with a video on the topic using visuals and sound.

Çeliköz et al. (2019) noted the importance of the brain finding clues to retrieve previously stored information. Teachers can know and teach strategies that aid students in this retrieval to support their academic careers. For example, when students quiz each other with flashcards, they retrieve previously stored information. Repeated practice is essential for retrieving information (Brown et al., 2014). Another example of retrieval that teachers can guide students with is making a mnemonic device. Making a mnemonic device breaks the new information apart with a song, acronym, or rhyme. “Please excuse my dear aunt Sally” (parentheses, exponents, multiplication, division, addition, subtraction) is a way to remember the order of operations when solving a math equation (Biffle, 2023).

Learning also depends on students' capability to direct their attention to the task at hand in a classroom (Brown et al., 2014). Attention awareness determines what information is encoded, stored in the brain, and ultimately stored in long-term memory. Not all students will automatically transfer information and need encouragement and multiple strategies to improve their academic performance. IPT supports understanding how WBT can aid in students’ learning and teachers’ usage of the strategies. IPT explains why a systematic process is needed in a

classroom environment for students to be successful. Those ideas can be applied to WBT strategies and aid educators in creating a classroom environment suited for consistency. For example, teachers' knowledge of IPT can lend itself to lessons incorporating retrieval cues of hand gestures for vocabulary definitions.

Those components make the connection of IPT to this research clear. Applying IPT can aid in adopting brain-based learning methodologies, such as WBT. Teachers can include these ideas in their daily teaching activities. This study examines how teachers use WBT techniques, including when and how they use them and their perceptions of their success. The theory of informational processing is woven into the base of this research and is an essential factor in the purpose and question.

Related Literature

Classroom teaching techniques and strategies can be informed by neuroscience. WBT incorporates various techniques and methods to aid teachers based on how the brain functions. Different styles and methods are indicated within the literature listed, as well as how understanding the parts of the brain aids the learning process. The WBT system elements, motivation, and social-emotional components are described, including the relationship to neuroscience.

Information Processing Theory (IPT)

IPT posits that information is the foundation of learning and is processed through a sensory register and thenmtransferred to memory (Schunk, 2020). IPT demonstrates that learning transpires through encoding, transfer, and retrieval. Brown et al. (2014) explained that encoding is taking sensory perceptions and changing them into representations of meaning in the brain. The transfer is when knowledge is utilized in new ways (Schunk, 2020). Finally, retrieval

happens after learning has occurred and results in using encoded information . Logan (2000) purported that IPT is the center of cognitive psychology. Logan continued to express that information processing models present representation, process, and architecture information. Representation is mentally encoded from the environment. The representation of the environment is in the form of thoughts that lead to actions. Schunk (2020) expressed transfer as linking and activating the memory. Once the information has been acquired and stored in memory, it must be retrieved for later use in similar or new situations. The architecture of retrieval can be determined in various ways in the brain, depending on the situation (Logan, 2000). IPT also focuses on the power of attention (Blinch et al., 2022). Çeliköz et al. (2019) explained that individuals control what they will pay attention to. Information processing theory provides a foundational understanding of how a person attains, stores, and retrieves knowledge.

Brain Function and Learning

Rasmitadila et al. (2021) explained that classrooms can proceed productively when instruction is centered on the foundations of the brain's natural learning systems. Dubinsky et al. (2022) expressed the importance of neuroscience in the educational field. Teachers must understand multiple disciplines, social sciences, and pedagogy, and it is also crucial for teachers to know how their students' brain function. When teachers understand the brain's functions, they can make better pedagogical decisions that positively impact all students. This study will explore teachers' usage and perceptions of various WBT methods, focusing on the brain's functions and how those perceptions and experiences shape their teaching and student learning growth.

The Prefrontal and Motor Cortex

Jensen and McConchie (2020) determined that the prefrontal cortex is the brain's reasoning center, where decisions are made. The prefrontal cortex can prompt the amygdala,

which controls emotions. LaVarco et al. (2022) shared that understanding subconscious emotions is vital for planning and learning. Thomas et al. (2019) stated that the prefrontal brain is responsible for executive functions, including academics, how students follow instructions, and general readiness for the classroom learning environment. Sharini et al. (2021) explained that the neurons in the motor cortex process complex information and control the direction of movement. Perikova et al. (2023) indicated that body movements can aid memory systems by leaving a mnemonic trace on the brain's cognitive processes. Perikova et al. demonstrated the connection between hand movement and the motor cortex neurons designed for speech processing. Blackmer (2018) explained that classrooms can improve attention, reduce behaviors, and increase engagement with movement incorporation. Moon et al. (2022) found that integrations of movement in conjunction with effective instructional management had a positive result.

The Visual Cortex

The brain's visual cortex receives, merges, and processes visual information transferred through the eyes (Huff et al., 2022). Huff et al. stated that each brain hemisphere has its visual cortex. The right brain area processes information input through the left eye, and the left brain area processes information from the right eye. The primary function of the visual cortex is to input, segment, and integrate visual information, which is sent to various parts of the brain to be utilized. The visual cortex processes aid the brain in identifying patterns and objects without strained conscious effort. Research has shown that adaptive human behavior is based on quickly and efficiently picking important visual stimuli (Ferrante et al., 2023). Themes derived from a study by Akar (2020) found that visual aids can support permanent learning. Ferrante et al. (2023) noted that visual input must be categorized by sorting actionable information and irrelevant stimuli. The visual cortex aids in thought and active learning. Humans learn from

experiences, the process of seeing, and having the brain form patterns with sorting (National Research Council, 2000). The research of Rademaker et al. (2019) indicated that when people are distracted, mnemonic input is interrupted, and early visual areas are pivotal in supporting working memory representations. Debes and Dragoi (2023) noted that attention aids perception by improving the neural encoding of sensory input.

The Limbic System

Long-term memory is stored in the hippocampus, part of the brain's limbic system; the limbic system controls emotions and memories (Tatar et al., 2022). Classroom teachers can utilize this information to structure memory cues that invoke emotion. Wardell et al.'s (2021) study indicated that emotional experiences stayed in one's mind after they occurred but varied by recall time. Classroom teachers can use their understanding of the limbic system to provoke memory cues by establishing surprise events. Foster and Keane (2019) expressed that when one is surprised and then must explain what transpired, that explanation impacts learning and memory of the event, allowing for memory encoding.

Wernicke's and Broca's Area

Rivera-Urbina et al. (2019) stated that Wernicke's brain area is related to the comprehension of written and spoken language. In addition to the perception of language, verbal memory processes are at work in this region. Broca's area is associated with language production and articulation (Wu et al., 2022). Tian et al. (2022) explained that deep learning requires cooperative learning, an exchange of ideas. Every student has various ways of thinking, bringing individual motivations, experiences, and emotions to the classroom. When students speak and listen, they add to their knowledge base by incorporating and sorting ideas, reflecting, and

deepening their knowledge. Both Wernicke's and Broca's brain areas are essential in learning through understanding and producing language.

Neuromyths and Limitations with Brain-Based Learning

A neuromyth is a misrepresented view or idea about the brain and learning from neuroscience (Hughes et al., 2022). Hughes et al. expressed that although neuromyths among pre-service and in-service teachers exist, research still needs to conclude how these myths translate and affect learner outcomes. Friedman et al. (2019) noted from the findings of a three-year study that when in-service teachers were exposed to neuroscience information, they could implement these strategies, demonstrating a high level of competency. Friedman et al. also pointed out that there are claims from neuroscience researchers that teachers need to understand neuroscience information. Van Atteveldt et al. (2019) concluded from their research that to eliminate miscommunications, all stakeholders must align to stop neuromyths. Van Dijk and Lane (2020) explained three ways neuromyths can begin: when scientific facts are oversimplified, outdated hypotheses, and results are misinterpreted. Friedman et al. (2019) noted that although there can be limitations, it is to the benefit of teachers to understand the function of the brain. Neuroscience information allows teachers to improve their craft derived from scientific facts about the brain. This study will explore teachers' usage and perceptions of WBT and how these perceptions interpret their experiences to aid their students.

Whole Brain Teaching (WBT)

WBT was established from the realization that the teacher lecture model does not aid in student growth; the longer the teacher speaks, the more students the teacher loses (Biffle, 2023). Biffle, Rekstad, and Vanderfin (2023) created a classroom learning system in the late 20th century that would work at any grade level. Over time, this system integrated more brain-friendly

methods that engage students' prompting willingness to learn (Biffle, 2023). Biffle noted that WBT educators are all individuals and utilize the WBT method differently; however, below lists five WBT guiding principles:

1. Teach the joy of living for others.
2. Make every kid a winner by rewarding them for improvement, not ability.
3. Talk less; teach more.
4. "Consequences" must strengthen bonds, not sever them (p.1).
5. Supremely engaging instruction involves reasoning, seeing, speaking, hearing, moving, and dice rolls.

The five principles are integrated into the instruction, motivation, and social-emotional elements of the WBT method. This study will investigate teachers' usage and perceptions of WBT methods and how teachers interpret and make sense of their experience to shape their teaching craft and aid their students' learning growth.

Whole Brain Teaching Elements

WBT comprises various instructional, motivational, and social-emotional elements, simultaneously incorporating multiple brain stimulations gamifying the classroom (Biffle, 2023). The research results of Greipl et al. (2021) concluded that on a neurofunctional level, game-based learning aids in the learning processes utilizing reward and emotional connections of engagement. WBT addresses the wandering mind compared to what happens to students in a lecture model, noting that unrelated thoughts flourish in the state of the wandering mind (Biffle, 2023). Students seek other stimulation that can cause off-task behavior, blurting, and other student distractors or disruptions. Wammes et al. (2019) noted that during lecture models at the university level, mind wandering correlates with poorer learning outcomes.

Biffle (2023) expressed that any educational problem that persists is based on a relationship problem. WBT utilizes the mindset, “We don’t fix kids; we fix relationships” (p.1). Odak et al. (2023) indicated how vital a teacher’s understanding of social and emotional issues is to the balance of a quality teacher-student relationship and the academic growth and well-being of the students. Compiling WBT instruction, motivation aspects, and social-emotional components create a successful instructional system for classroom teachers. This study will explore teacher perceptions of the various WBT instructional strategies and how those perceptions impact student learning.

Whole Brain Teaching Instruction

WBT utilizes an instructional procedure called *the magic circle*. The foundation of this teaching technique is that the teacher speaks less and teaches more effectively (Biffle, 2023). The magic circle consists of five interchangeable steps:

1. The greeting: Attention-Getter. The teacher can begin with various greetings depending on the time of day, lesson, or situation. A morning greeting can be initiated by the teacher saying. “Good morning, class,” as the teacher gestures by extending their arms to welcome the class, stimulating students’ visual and motor cortex. The students respond, “Good morning, Mr. Smith.” Students make the same gesture in return. The attention-getter can direct students’ attention to the teacher at any time by the teacher saying “Class,” looking out at the class, and folding their hands with full attention. In response, the class folds their hands and quickly looks at the teacher, saying, “Yes.” Various class-yes callouts can be utilized, such as “Class, oh mighty class”, “Magnificent class”, or ”Ready, set class” (p. 46).

2. Thank You/You're Welcome. This step integrates manners into daily lessons. Once the teacher has the class's attention, the teacher says, "Thank you," gesturing with their hand on their heart. In reply, the students have been taught to say, "You're welcome," mimicking the teacher's gesture (p. 47).
3. Mirror Words. The teacher raises both hands open, facing the class, palms out, and says, "Mirror words." The students quickly lift their hands and repeat, "Mirror words." The students are now ready to engage with the teacher's lesson by mimicking the teacher's words and gestures (p. 48).
4. Teach One New Point Repeated Twice. This step is the lesson chunk. Teachers must break down their lessons into one-minute chunks, teaching only one new point at a time. The teacher uses memory gestures for concepts students are mimicking, such as fraction gestures, compare and contrast gestures, or a motion for an adjective or preposition. Teachers repeat that new point with students mimicking gestures and the teacher's voice.
5. Teach-Okay. Collaborative learning happens during the teach-okay step. Students turn to a partner and paraphrase what they have learned using gestures .

Once students understand the magic circle's gestures and patterns, the teacher can use them in ways that work for their lessons. For example, a teacher could start with mirror words after teach-okay, skipping the attention-getter if deemed appropriate.

WBT utilizes the magic circle to teach academic lessons, rules, and procedures. WBT classroom rules consist of six specific rules with gestures (Biffle, 2023).

1. Follow directions quickly. The gesture is to swim a hand quickly through the air.
2. Raise your hand for permission to speak. This gesture includes raising a hand and then using a hand to make a speaking gesture.

3. Raise your hand for permission to leave your seat. The gesture is extending an arm horizontally, then taking the other hand and walking fingers down the arm.
4. Make smart choices. Tapping the temple three times with a forefinger is the gesture for this rule.
5. Make our dear team stronger. This gesture includes putting fists on top of each other and then making muscle gestures with both arms.

Diamond Rule: Keep your eye on the target. This gesture uses the thumb and forefinger of both hands, making a diamond shape, then putting two fingers at the eyes and outward at a target. WBT utilizes the magic circle and the listed rules to integrate engagement and lessen problem behaviors. This study will examine how the WBT system affects teaching in the classroom.

Whole Brain Teaching Motivation

WBT focus is on systems utilizing intrinsic motivation for academic and social growth by rewarding improvement (Biffle, 2023). Gan et al. (2023) explained that intrinsic motivation is when one participates in tasks for interest in the task or enjoyment because of a challenge and the learning of new things to expand and grow. WBT has multiple ways to motivate students in a game format. WBT teachers transform their classrooms into living video games (Biffle, 2023). Starries, Super Improver, Scoreboard, Bullseye, and other intrinsic motivators in a game model are some staples that WBT utilizes in their classrooms. The main component of all the motivation elements is that teachers reward students for improvement, not ability. Biffle indicated that rewarding for improvement gives inclusivity; not just the top academic students are awarded, and everyone can improve. All of the motivation elements in WBT utilize a game mind that centers on uncertain rewards.

Starries. Starries can be utilized throughout the year; however, this game is a motivator that can be introduced and used on day one of the school year (Biffle, 2023). Teachers set up a ten-by-ten grid, and when the teacher notes any classroom improvement, the class receives a starry on that grid. Teachers can use the game to benefit their daily plans by setting a timer and incorporating dice rolls to enhance the excitement, earn bonus starries, and unlock new games.

Super Improvers. Super Improver is a core game of the WBT system (Biffle, 2023). Super Improvers creates a classroom constantly in a living video game. This game can be utilized as individual intrinsic motivation. Super Improvers is set up in a focal point of the room, and students' level up by improving in any activity or action. Level cards are made, and students earn stars for each level to level up. Biffle noted that for students to level up, they can improve on anything. Improvements apply to any academic or character improvement anytime a day . Students can improve on following directions quickly, being positive leaders, asking related lesson questions, adding details to their writing, or anything the teacher wants students to improve. Stars can be added during teach-okay, when students line up correctly, or at any chosen time . Dice rolls can be implemented to add stars for students or used for students to give away stars to other improving students. Biffle explained many options to keep Super Improvers fresh, unpredictable, and engaging.

Scoreboard. Scoreboard is a whole class motivator (Biffle, 2023). Scoreboard is a game that motivates all students at the same time. Instead of redirection, the wrong-way and right-way behaviors and effort are scored on a t-chart on the whiteboard or digitally. Students are never singled out; only the whole class is prompted. The scoreboard game can be utilized throughout the day to promote optimal classroom engagement, behaviors, and effort.

Bullseye. The bullseye game can be utilized with the beloved rascals of the class (Biffle, 2023). This game is for the beloved rascal and the teacher. The bullseye is a poster with numbers 1-5, with 5 being the center and the target behavior. The teacher role-plays wrong-way and right-way behavior. Biffle explained that the teacher lets the student know that at the end of the day, the student will write down the score they believed they earned for the target behavior while the teacher does the same. If the teacher and student have matching scores, the student earns two Super Improver points; off by one point, the student earns one point; any other difference is no point. Game variations can transpire for student buy-in, such as adding dice rolls or having more than one session daily . The bullseye game allows for the student to analyze their behavior, rewards for honesty, and grows the student-teacher relationship.

Whole Brain Teaching Social-Emotional Component

Biffle (2023) indicated that all educational issues begin with relationships, and students can be disconnected from healing bonds; the mantra of WBT is the quote, “Only Connect” (Forster & Armstrong, 1998, p. 3). WBT seeks to connect teachers and students, and students and students, creating a community of kindness (Biffle, 2023). WBT incorporates many activities and classroom systems to instill character education and moral growth into the classroom daily. AlphaHawk, daily virtues, and peace circle are a few of the systems that can be implemented to aid students with social-emotional growth.

AlphaHawk. In WBT, an AlphaHawk lives for others (Biffle, 2023). An AlphaHawk is a person who could be famous around the world, a family member, or a friend. Biffle explained that an AlphaHawk is not specifically a role model who can be good at following directions or skills but a person who is selfless and lives for others. AlphaHawks gives students a moral compass and is genuinely kind. This AlphaHawk game begins with the teacher giving a personal

example and bringing a picture of their AlphaHawk to display on the AlphaHawk wall in the classroom. Biffle used Mother Teresa, Cesar Chavez, and parents as examples of an AlphaHawk. Students bring in pictures of their AlphaHawks and explain why that person lives for others. Students also have a desk card where they draw a picture of their AlphaHawk, and this card is for when students feel stressed; they can place their hand on their life guide and think of what the AlphaHawk might do. When students make their AlphaHawk proud, they color a star on the desk card. That card incorporates selfless inspiration for students throughout the day.

Daily Virtues. The daily virtues or happies are discussed and merged into the daily classroom routines (Biffle, 2023). The following five happies are inserted into the WBT rule 4 of making smart choices: glorious kindness, positive leadership, selfless courage, invincible grit, and brainy creativity. When students review the WBT rules and get to number 4, they add the happies, and each happy has a gesture that the students incorporate. Each happy is assigned a day of the week to practice with the gesture. For example, glorious kindness can be practiced on Monday by giving examples, such as noticing when other students are showing kindness. Super Improver stars can be provided for student growth in any happies area throughout the day.

Peace Circle. To bond and connect as a classroom community, WBT teachers can utilize the peace circle as a relationship builder between students (Biffle, 2023). The students pick a stick with a classmate's name as their day friend. The teacher sets a timer for two minutes and then completes the sentence stem of "I feel_____" positively identifying their feelings. Next, a die is rolled, and if a 1, 2, or 3 is rolled, the teacher compliments the day friend. If a 4 or 5 is rolled, no compliment, and everyone chants, "We've got grit! We don't quit!" a 6 roll is a re-roll (p. 150). The game continues around the circle until the timer goes off. The power of WBT is stopping games before habituation sets in. The peace circle allows students to learn the

difference between a shallow and deep compliment. Peace circle will enable students to think critically about the people around them and practice giving deep compliments, providing more kindness to the classroom community.

Neuroscience and Whole Brain Teaching

Neuroscience research has indicated that the brain is versatile; the brain can adapt and change, known as neuroplasticity (Draganski et al., 2004). Draganski et al. explained that neuroplasticity occurs when the brain experiences new activity and is learning. Doyon et al. (2003) indicated that different learning methods affect how the brain processes information. For example, when a new skill is being learned, the brain processes procedural learning; this involves the basal ganglia and the motor cortex parts. When problem-solving and complex or multistep learning tasks are engaged, the prefrontal cortex of the brain is activated (Bunge & Zelazo, 2006). Moses et al. (2019) conducted a study using electrocorticography (ECoG), which recorded brain activity in patients as they participated in a question-and-answer dialogue. The findings revealed that brain activity in response to questions differed from that in response to answers, with question-related activity concentrated in the frontal and temporal cortices and answer-related activity concentrated in the temporal and parietal cortices. The results imply that the brain processes information differently depending on the type of learning occurring, even during more complex tasks like speech dialogue. Information Processing Theory (IPT) posited that the brain processes information differently depending on the learning taking place and that different brain regions have specific purposes in processing the different types of information (Schunk, 2020). A study by Jung-Beeman (2005) found that insight-based problem-solving tasks involve the anterior cingulate cortex and the hippocampus, while analytic problem-solving involves the dorsolateral prefrontal cortex.

WBT is a methodology that incorporates teaching strategies that appeal to both sides of the brain, resulting in improved engagement and recall of information (Biffle, 2023). WBT utilizes a variety of elements, including classroom rules, manners, active participation, multiple transitions, direct instruction, and positive reinforcement, with specific techniques designed to engage both hemispheres of the brain, such as mirror words, teach-okay, and games that can be played throughout the year. Research has shown that students who learn in environments that engage both hemispheres of the brain demonstrate more significant improvement in recall of information than students who utilize learning techniques that employ only one hemisphere of the brain (Gülpinar et al., 2015). Additionally, students completing problem-solving tasks who engage in activities that utilize both hemispheres of the brain show more excellent performance than those who use only one hemisphere (Gazzaniga et al., 2012).

WBT incorporates learning styles, such as visual, auditory, and kinesthetic, providing strategies that utilize multiple brain areas. Howard-Jones (2014), who writes about a distortion of information within research about neuroscience and education, explained that learning can be supported with multisensory modes. Emyus et al. (2020) also expressed that WBT strategies can affect children's motor and language skills. WBT offers a multimodal learning experience using visual aids, music, or rhymes and adding movement into lessons, activating many brain regions simultaneously (Biffle, 2023). WBT involves active participation from learners, such as call and response, games, and peer discussions, stimulating various brain regions. As previous studies show, this study will attempt to probe the usage of a teaching system with a focus on the brain’s functions.

Traditional Learning Versus Whole Brain Teaching

Traditional learning in education is an approach where the teacher leads, and the students are passive listeners receiving information (Al-Mubireek, 2021). Traditional learning consists of the teacher delivering the content and the students taking notes, memorizing, and taking tests to demonstrate comprehension. The traditional learning method has been successful in past years but has limitations for students. Traditional learning or the lecture model does not aid students in various learning styles (Biffle, 2023). Traditional learning does not promote problem-solving, critical thinking, or creative exploration of ideas. Al-Mubireek (2021) found that traditional education negatively impacted students' motivation. Students experienced anxiety, boredom, and apathy toward their learning experience. Traditional education does not prepare students for their future in a century of problem-solving, collaboration, and looking at a problem in a creative way. The traditional education system is primarily based on rote learning, which does not consider the brain's limited capacity to process information. Wagh (2021) explained that teachers should utilize methods that engage students in developing needed problem-solving skills. Bruner (1966) expressed that rote learning does not allow students to gain access to deep learning or transfer knowledge to a new situation, as the informational processing theory demonstrated. Bruner explained that learners construct their knowledge through active participation in learning. The traditional education system is teacher-centered, not providing active participation and engagement; traditional learning does not align with IPT.

Findings from Martella et al. (2020) found that students who participate in active learning have a higher understanding of the topic and are more capable of transferring their knowledge to new situations. WBT is a teaching methodology that engages all parts of the brain in the learning process in a relevant manner (Biffle, 2023). IPT indicates that learners are limited to processing

information in one setting; learners selectively pay attention to pertinent information (Schunk, 2020). WBT aligns with IPT by utilizing various techniques to engage students, ensure information processing, and deliver information in small chunks (Priyadarshini et al., 2019). WBT incorporates gestures, movement, and voice cues, activating multiple brain areas and aiding in memory. WBT aligns with the principle of active participation by utilizing student-centered approaches (Biffle, 2023). One of the ultimate goals in WBT is student-led lessons. Elfiky (2022) explained how WBT integrates cooperative learning strategies where students solve problems, answer questions, and reinforce key concepts. McTighe and Willis (2019) stressed that teaching strategies promote active learning and incorporate scaffolding approaches, allowing students to apply what they have previously learned to real-world situations. This study will examine how WBT aligns with the principles of IPT by utilizing the WBT strategies by classroom teachers.

Brain-Based Learning Strategies within Curriculum and Instruction

WBT incorporates neuroscience and cognitive psychology principles and is a brain-based learning strategy (Biffle, 2023). However, it is a distinct teaching method with distinctive features and techniques. WBT employs strategies, such as engaging students in multisensory activities, using movement and gestures to support learning, encouraging active participation and feedback, and fostering a positive emotional climate in the classroom. WBT utilizes direct instruction and collaborative learning. Direct instruction and collaborative learning are consistent with research-based brain-based learning principles, such as the importance of attention, memory, emotion, and motivation in learning (Brown et al., 2014).

Brain-based learning is an integration of neuroscience into curriculum and instruction (McTighe & Willis, 2019). McTighe and Willis explained that brain-based learning strategies aid

student growth and academic achievement. Brain-based strategies, such as multisensory, social-emotional, and experiential learning, are a foundation for successful teacher-guided strategies. Additionally, McTighe and Willis purported that neuroscience can aid educators in understanding how the brain functions and apply best practices in the classroom. Hunt and Holmes (2018) expressed that when students are motivated by challenges, they are ready to learn. Teachers can promote those challenges in learning by incorporating multiple learning modalities into their instruction. Learning can be fun and engaging when students have a positive social-emotional environment and know how to work with others. Sousa (2021) stated that neuroscience can aid teachers in understanding that the brain's limbic system has the job of encoding emotions, which can transfer into one's long-term memory. Hunt and Holmes (2018) and Sousa (2021) contribute to this study by investigating how teachers who comprehend how the brain learns create instruction that naturally works for their students.

Direct Instruction

Direct instruction can be integrated into classroom routines to be interactive and engaging (Rolf & Slocum, 2021). Rolf and Slocum determined that direct instruction is interweaving interactions between the teacher and student, which are the basis of the lessons created. Rolf and Slocum explained that direct instruction includes various structures within the lesson. Direct instruction is a thoughtful process with specific instructional sequencing; students are guided to skill mastery with active student responses. A study completed by Yaghmour and Obaidat (2022) indicated that direct instruction lessons positively affected third-grade students' comprehension abilities. Zhang (2022) suggested, from reviewing current education literature, that direct instruction combined with hands-on learning is a positive teaching model. Integrating

investigative learning and direct instruction teaching methods can aid in developing conceptual and procedural student knowledge.

Collaborative Learning

Qureshi et al. (2021) stated that collaborative learning energizes students to participate in reading, listening, writing, and reflecting on projects or lessons together. Attention and perseverance have been attributed to students collaborating in their studies, lessons, or learning processes. Teachers who utilize collaborative learning within their teaching models have effective strategies for using feedback, prompting questions, and transferring control of the learning process to the students (Van Leeuwen & Janssen, 2019). Van Leeuwen and Janssen expressed that research has indicated that teachers must maintain a balance with their guidance. A review conducted by Van Leeuwen and Janssen resulted in findings that indicate teachers should try to focus on the skill level of the task and the current student collaboration and communication within the group. Teachers can acquire a focus on the skill level by concentrating on students' problem-solving strategies and how students collaborate. Van Leeuwen and Janssen continue to explain that teachers can transfer control of the learning process by ensuring students know that the teacher is there to help without giving the help and letting students solve things independently.

Multisensory Learning

Multisensory learning utilizes multiple modalities to encode information in the brain (Watagodakumbura, 2017). Watagodakumbura purported that tasks that depend on thoughtful effort, such as using multiple modalities, result in the brain actively engaging in problem-solving or bouncing back and forth between the modalities. Furthermore, Çeliköz et al. (2019) noted that memory is acquired by the five senses and recorded in the brain. IPT tenets demonstrate that

information begins learning and postulates that sensory stimuli are transferred to process the moment into memory. Multisensory learning requires the brain to work for the result versus the automaticity of one modality, such as listening to a teacher's lecture. Research conducted by Broadbent et al. (2018) indicated that learning through multiple modalities versus unimodal cues in 6-10-year-old children comprehended information quickly. Multisensory learning can include using movement, song, and other visual, kinesthetic, auditory, or tactile aids (Watagodakumbura, 2017). Another study by Tsang and Lu (2022) found that utilizing movement methods to teach students activates the frontal cortex and significantly improves memory and learning by engaging multiple modalities, enhancing the encoding and retrieval process. Elfiky (2022) expressed that the effects of utilizing WBT methods boost number competencies and math fluency. Multisensory learning within WBT can be a powerful approach to engage students, promoting their learning.

Movement Incorporation in the Classroom. Moon et al. (2022) explained that movement integration (MI) regularly utilized within the general classroom is supported by research to reduce off-task behavior and support student academic performance. Natural transitions or classroom routines can allow teachers to implement MI regularly throughout the day (Michael et al., 2019). Michael et al. expressed that incorporating a balanced classroom management system that allows students to move around the classroom independently during on-task activities, such as having learning materials in various locations and multiple transitions that provoke movement, do not require any new resources and can be effective movement strategy integration. Buchanan et al. (2021) noted the benefits of physical movement and how short classroom movement activities can enhance the learning process. Buchanan et al.'s study on brain energizers in a 1st-grade classroom related that these short movement breaks or brain

energizers decreased off-task behavior and were utilized in classrooms as a positive reinforcement tool within teachers' classroom management plan. The study by Buchanan et al. indicated that teachers could ask students to focus on the task at hand for an allotted amount of time; if the focus were maintained, students would have a brain energizer. A focused time structure was effective compared to teachers stating repetitive, ineffective directions.

Gestures. Aussems and Kita (2019) explained that utilizing gestures and movements of a person's body is one form of multisensory learning. Aussems and Kita researched the outcome of children seeing gestures used and whether they remember the event. The results indicated that children who watched gestures that matched the action happening retained that event. However, children who saw gestures unrelated to the event or activity did not have the memory. Aussems and Kita concluded that the children did not encode the information because the gesture did not relate to the action. Neuroimaging has indicated that gestures are linked to meaning at the time and have shown a different pattern in the brain than when gestures that are not connected to the topic or activity are used (Overoye & Storm, 2019). Overoye and Storm wanted to determine if gestures help memory when speaking. The researchers found that when retrieving a memory of speech, the memory of the gesture can aid in recalling that memory. Overoye and Storm's research aids in understanding how the brain learns and promotes multisensory learning to retrieve memories.

WBT utilizes many gesture techniques to engage students (Biffle, 2023). Biffle (2018) explained that by using WBT, teachers deliver lessons using the magic circle cycle. It begins with the teacher attaining the class's attention by saying, "Class," and the students stop what they are doing, look at the teacher, fold their hands together, and then say, "Yes." (Biffle, 2023, p.46). The next step is to incorporate manners by the teacher saying, "Thank you, class," and putting

their hands up to their heart (p.47). The class responds with, "Your welcome, *teacher's name,*" also putting hands to heart (p.47). The third part of the magic circle cycle is the brain engager of mirror words. Students will mirror or repeat gestures the teacher delivers, such as big, fast, or slow-motion gestures. The teacher uses gestures for about one minute of direct instruction, talking about one new point at a time while the students mirror the gestures. Lastly, in the cycle, students participate in collaborative learning, the *teach-okay* part of the cycle. Students teach their neighbor the lesson using gestures while the teacher moves through the classroom, assessing student readiness for the next chunk of the lesson. Biffle explained that this cycle reinforces the new learning in students' minds. Gestures are also utilized with the whole class behavior management for the WBT scoreboard game. The scoreboard gesture is used for students to respond by raising their hands and cheering when the class team earns a point for improvement (Biffle, 2018). WBT gestures utilized throughout the day in classrooms aid in keeping students engaged and interested in their learning, leading to improved learning outcomes.

In a study conducted by Carrazza et al. (2021), researchers examined the use of gestures, finding that gestures can impact learning in different ways when the learner is active in the gestures versus when the learner observes the gestures. Another study completed by Clark and Trofimovich (2016) found that adult learners using gestures affected classroom interaction and participation. Teachers can create a more interactive and multisensory learning experience for their students by incorporating movement and gestures into instruction and improving learning outcomes. WBT gestures can create a more dynamic learning environment for students.

Song/Chant Implementation. Retrieving memories to learn can be formulated by using multisensory learning (Carrazza et al., 2021). As well as gestures to aid in memory, music can be

part of a teacher's pedagogy. Werner (2018) purported that any subject taught can be put into familiar songs and linked with matching gestures. Teaching new topics through song lyrics and meaningful gestures activates the senses, recall, and knowledge transfer. In a study conducted by Tavsanli et al. (2021), they determined that music, combined with teaching vocabulary words and their meanings, resulted in practical student progress. WBT can implement songs and rhymes into the magic circle lessons (Biffle, 2023). Lems (2018) noted that the brain's limbic system is responsive to music, which can invoke an emotional response. Emotion drives a person's thoughts and decisions, and when students enjoy learning, it promotes a positive learning outcome (Biffle, 2023). Coch (2018) found that neuroscience is essential in growing an educational culture.

Experiential Learning

Experiential learning utilizes strategies of students' experiences with their education to provide positive academic outcomes. Experiential activities allow students to use their existing knowledge and experiences, applying that knowledge to solve problems and learn new information (Dao et al., 2021). Ütkür Güllühan et al. (2022) researched the effects of the Storyline Method in museum education on the interpretations and perceptions of students on historical artifacts, finding a positive outcome of this experiential learning method. Dao et al. (2021) explained that experiential activities are learner-centered, and teachers can create an environment that allows students to grow in complex tasks that merge knowledge, skills, and attitudes.

Social-Emotional Learning

In addition to multisensory learning strategies, gesture usage, songs, and experiences to aid teaching strategies, the classroom teacher has a magnitude of other responsibilities, and one

of those responsibilities is ensuring that social-emotional learning is transpiring in conjunction with academic knowledge (Biffle, 2023). Research conducted by Wardell et al. (2021) concluded that emotional experiences affect one's memory and are remembered long after the occurrence of the experience. Wardell et al.'s research indicates that classroom teachers must provide vivid and memorable experiences, creating an emotional response. Salem (2017) expressed that the brain utilizes the entire body, and emotions are part of that processing system. As students grow physically, their brains mature and grow as well; this growth brings self-evaluation, abstract thoughts, and maneuvering the social climate of their environment (Jansen & Kiefer, 2020).

A classroom setting can provide positive social interactions to aid social growth and support strategies that engage social-emotional growth and learning (Biffle, 2023). Schunk (2020) noted that cognitive load, the pressures on the brain's information processing, decreases when students work collaboratively. Rasmitadila et al. (2021) conducted qualitative research and discovered that teachers who utilized brain-based learning strategies to include collaborative social interactions within their instruction experienced enthusiastic students engaged in the learning tasks. McCall (2018) expressed that in classrooms using mind/brain-based strategies, cooperative learning amplifies students' abilities to work with a team, work independently, and hone their social skills. Teachers can instruct students how to interact positively with others, providing peer support when working on academics. Boardman et al. (2018) discussed how some cooperative learning models incorporate students to have different responsibilities for the group, which inspires self-significance and importance to the group. Hall and DiPerna (2017) noted that social skill training promotes success for students throughout their academic careers. However, in research conducted by Hall and DiPerna, they found that behavior and academic correlation were insignificant. The researchers explained that self-regulation could be a factor in their

findings. Jansen and Kiefer (2020) expressed the importance of teaching self-regulatory behaviors to help students prepare for complex tasks. Sousa (2021) noted that neuroscience has indicated that social-emotional advancement does correlate with cognitive improvement. McCall (2018) suggested that neuroscience discoveries impact education, revealing the importance of emotions in the classroom. The way the brain absorbs information and supports learning aligns with the significance of social-emotional learning practices in the classroom.

WBT incorporates social-emotional aspects within daily routines (Biffle, 2023). WBT encompasses social-emotional learning into strategies that can be utilized in the classroom in a fun and memorable way. Biffle(2018) explained that social skills are woven into all aspects of all lessons and students' experiences throughout the day. For example, fiver and cheery dice is a check-in game for students to recognize, reflect, and improve their moods. The AlphaHawk program within WBT builds bonds with teachers and inspires students to make smart choices while recognizing others in their lives (Biffle, 2023). Whole Brain teachers implement virtues into the content area, teaching character education with a virtue weekly calendar (Biffle, 2018). The purpose of WBT is for students to be rewarded intrinsically for improvements. The WBT methodology can aid student improvements by incorporating neuroscience and social-emotional strategies.

Teachers' Perception and Usage of Brain-Based Learning

Dubinsky et al. (2022) stated that teachers draw links between their knowledge of neuroscience and educational practices to explain why student-centered pedagogies motivate and engage learners. Research completed by Dubinsky et al. noted that teachers indicate that neuroscience aids with pedagogies that promote higher-level thinking and deeper learning with their students. Understanding neuroscience creates cognitive classroom participation from

students where teachers can plan pedagogies that include analysis, synthesis, and discussions to reach learning objectives. According to Dubinsky et al., preservice and in-service teachers should be provided with neuroscience courses where a connection between scientists and educators can incorporate neuroscience into pedagogy and classrooms today.

Alanazi's (2020) research found that teachers' perceptions of brain-based learning were viewed positively. Teachers participating in Alanazi's study found brain-based learning a practical teaching approach. That study did not find differences in teachers' outlooks on brain-based learning regarding teacher experience or school. Rasmitadila et al. (2021) research revealed that general education teachers found instruction based on how the brain naturally learns gives engagement and excitement to students' learning, specifically at the beginning of instruction where students can achieve experience and learning objectives presented within the lesson model. Rasmitadila et al. noted that brain-based learning techniques increase all students' enthusiasm and interests, sparking their excitement for challenging learning as described by general education teachers.

In a study conducted by Gutshall (2020), the results from teaching educators about brain concepts and understanding neuroscience indicate that this knowledge can impact elementary school teachers' beliefs. At the beginning of the study, 68% of the teachers rated themselves as having a growth mindset, and after six sessions of instruction, they re-rated at 83%, which is essential in the educational field for teachers to facilitate a positive impact on their students. Bana and Cranmore (2019) found that teachers who participated in professional development on neuroscience perceived the professional development to influence their teaching practice. Teachers explained that understanding neuroscience allowed them to understand various things, such as student behaviors and academic concerns. Many teachers explained that teacher

preparation courses did not include information on neuroscience; teachers went on to note that understanding neuroscience is not enough. Educators must understand what *neuroscience* means for the teaching processes in the classroom to aid their students best. Participants from Bana and Cranmore's study expressed that when teachers understand neuroscience, they come to understand not to take students' interest or disinterest personally. When one understands how the brain functions, they realize that there are many factors that teachers should consider. Bana and Cranmore reported that when teachers have neuroscience knowledge, those teachers positively perceive this.

A study by Tham et al. (2019) found that teachers are most interested in finding classroom strategies and implementations of neuroscience within the classroom and understanding learning disorders. Teachers indicated they preferred straightforward readings that quickly addressed essential brain-based classroom strategies. Teachers felt time was a factor because they were busy teaching and did not have time to research brain-based strategies, expressing that they preferred articles or reading that simplified brain-based research and classroom strategies. By understanding what those studies have determined about teachers' interests and needs regarding brain-based strategies and research, a clear gap is revealed, finding limited information about the WBT system and how teachers using this system experience and perceive it (Elfiky, 2022). Those studies contributed to this study by understanding and establishing the gap in the literature about teacher’s experiences and usage of WBT and how those experiences shape their teaching method.

Teacher Mindset

Gholami et al. (2022) explained that research has shown that teachers’ beliefs and knowledge are essential factors that correlate with their teaching practices and decision-making

within the classroom. According to Gholami et al.'s study, teachers' knowledge of neuroplasticity engaged in a growth mindset and a quality epistemological belief system. Gholami et al.'s study promotes the predictability of a growth mindset when teachers have neuroscience knowledge. DeLuca et al. (2019) found that teachers with a growth mindset utilize creativity and open-ended activities to promote critical thinking.

Kaya and Yuksel (2022) described mindset as one of the essential characteristics contributing to teachers' educational success. A teacher's mindset incorporates a teacher's skills and abilities and what they think about developing those skills. Nalipay et al.'s (2021) research discovered that when teachers have a growth mindset, that growth mindset aids in teachers' workflow and engagement. A growth mindset allows teachers to become more engaged in teaching skills, working beyond expectations in their teaching methods.

A study by Frondozo et al. (2020) posited that teaching mindsets are related to emotions established through engagement, such as enjoyment. Teachers perceive utilizing their teaching skills as a chance to improve those skills, leading to enjoyment and wanting to be more engaged with their abilities. Frondozo et al. also found that a teacher with a growth mindset was less likely to have anxiety and anger issues, matching the findings of emotions correlating with a teacher's mindset. Granziera and Perera (2019) discovered a noteworthy result: there is a significant relationship between work satisfaction and teacher engagement. Findings from Granziera and Perera indicated that teacher engagement predicts positive changes in happiness at work, and work satisfaction predicts teacher self-efficacy positively.

Teachers' Development of Brain-Based Compatible Classrooms

The classroom environment indicates student engagement and impacts academic progress (Cole et al., 2021). Cole et al.'s research shows students' ownership over their learning tasks

when they are in an environment where they pick their own working space to fit their personal needs. The findings from Cole et al. supported that when students can make choices based on their learning styles of where they will work in the classroom, they are more engaged during independent and collaborative learning tasks. Cole et al.'s study indicated that students preferred movement during flexible seating versus inactivity or sitting in a traditional chair. The research completed by Cole et al. also found that students were less disruptive behaviorally when flexible seats were available.

Venketsamy et al.'s (2020) research showed that teachers place a high value on an invitational learning environment where teaching and student achievement are acquired. Teachers also noted that an invitational learning environment was essential for teacher effectiveness and morale. Venketsamy et al. found that the physical classroom environment should include a decorative component, educational posters, lighting, and ventilation to create an inviting space. As well as a comfortable and attractive learning environment, teachers pointed out that they must be approachable to the students through encouragement and positive reinforcement. An orderly classroom environment is vital for student collaboration, practical learning, and student-teacher relationships. Developing rules with the class can form community and ownership with the classroom discipline plan, strengthening the order and respect of the classroom. Torgyik (2022) expressed the importance of a class community because it gives students a feeling of acceptance and belonging. This study explored teachers' usage and perceptions of various WBT instructional methods and classroom management. This study focuses on how the brain operates in a classroom setting and how perceptions and experiences influence teachers' instruction and the development of students' learning.

Summary

It is essential to comprehend how WBT techniques are used in schools today and how teachers feel about these techniques. The theory of information processing provides a foundation for understanding this topic. The literature reviewed focuses on the relationship between neuroscience and learning and brain-based learning strategies in curriculum and instruction. However, there is a gap in the literature regarding teachers' usage of WBT strategies, their perceptions of these methods, and how this relates to their emphasis in the classroom. There is limited research on WBT strategies in general. This study can help bridge those gaps by providing a holistic understanding of how teachers perceive and adapt WBT in their classrooms. Further research is needed to explore teachers' perspectives on implementing WBT strategies into classroom routines. Through analyzing WBT views, instructors can acquire valuable insights into optimizing WBT strategies and assisting students in attaining academic and social-emotional achievement.

CHAPTER THREE: METHODS

The purpose of this hermeneutic phenomenology study was to understand Whole Brain Teaching (WBT) through the experiences and perceptions of teachers who utilize this system in the United States. This chapter explains why hermeneutic phenomenology was utilized. In addition, this chapter describes the study's research design, the setting and participants, and the researcher's positionality. The data collection plan and analysis of individual interviews, journal prompts, and focus group interviews are explained. The chapter ends with an explanation of trustworthiness and ethical considerations for the study.

Research Design

Creswell and Poth (2018) explained that qualitative research is the base that uses interpretive/theoretical frameworks that guide the research problem. I chose to do a qualitative study because I was intrigued to investigate teachers' perceptions of the WBT system within the base of informational processing theory. Phenomenology seeks to reveal the lived experiences of the world. Moustakas (1994) explained that all knowledge and experiences are tightly linked to phenomena, meaning there must be a unity between what we know and what we depend on. Researchers utilize phenomenology studies to describe the lived experiences of several individuals to determine the essence of that phenomenon (Creswell & Poth, 2018). In a phenomenological study, the researcher is the instrument who reflects upon the experience, seeing and feeling what is presented and then analyzing the data collected. Moustakas (1994) noted that the phenomenon is similar to what occurs in the consciousness. The researcher seeks to acquire knowledge through observations and reflections on the essence of the lived experiences. Human science research aims to study the experience, focus on the entirety of the experience, and search for meaning through first-person accounts. A hermeneutic

phenomenology incorporates a cycle of scientific understanding where any prejudgment is set aside, and the researcher can absorb the essence of the experience. Hermeneutic science is the art of reading a text to fully comprehend the meaning and intentions. Van Manen (2014) expressed phenomenological methods are a state of wonder about phenomena as they show themselves.

A hermeneutic phenomenological study was appropriate for understanding the experiences and perceptions of teachers who utilize WBT and how teachers interpret and make sense of their experience to shape their teaching and their student's learning. A phenomenology was appropriate because many participants must be interviewed to obtain common themes from this teaching method. A hermeneutic study was chosen because I have experienced WBT and will interpret the common themes of the participants' lived experiences. Van Manen (2014) expressed that a phenomenological question can appear for a researcher when an experience allows the researcher to reflect. A hermeneutic phenomenology aided in discovering teachers' subjective experiences and perceptions utilizing WBT and how this experience shapes teachers' instruction. This study aimed to interpret and make sense of the experience's essence with a phenomenology research design. Using a hermeneutical phenomenology design was appropriate in this study to bring the WBT experience in the United States to light.

Research Questions

To understand WBT's influence, it was essential to understand teachers' perceptions of WBT in classrooms across the United States. The following research questions helped provide insights into teachers' perceptions of WBT's influence on teaching methods, students' needs, and students' knowledge retrieval. These questions offered valuable insights into the WBT system and its influence on classrooms.

Central Research Question

What are the perceptions of classroom success for teachers who use WBT systems?

Sub-Question One

How do teachers perceive the WBT system within their teaching method?

Sub-Question Two

How do teachers understand how the WBT system fits their students' needs?

Sub-Question Three

How do teachers perceive students' knowledge retrieval when utilizing the WBT system?

Setting and Participants

This study focused on K-12 teachers across the United States who utilized the WBT system. Using Zoom interviews, 11 teachers from various geographic locations and educational settings were contacted and interviewed. The participants, who had at least one year of experience with WBT, provided rich data, allowing for an in-depth exploration of the system's influence in classroom environments.

Setting

The WBT community spans the world; however, this study focused on teachers utilizing WBT methods in the United States. I contacted teachers using WBT through Zoom meetings. The geographic location varied across the United States depending on where the teacher lived and worked. The site was within the K-12 setting of various schools in the United States.

Participants

Participants of this study were K-12 teachers from various schools and content areas in the United States, including special/resource education, general education, and intervention specialists. Participants had at least one year of utilizing the WBT system and at least three years

of teaching overall. A demographic survey was posted in the teacher group for interested participants to complete to determine teaching parameters for the study. Permission was granted by the manager of the teacher group. The number of participants interviewed was 11. This participant number enabled the collection of rich accounts to triangulate the experiences of WBT teachers. The study's output should have sufficient experiential material to produce an academic and thoughtful phenomenological text (van Manen, 2014). The 11 participants allowed for data saturation, where no further data was necessary (Moustakas, 1994). This participant number allowed for effective data analysis and conclusions to be determined.

Recruitment Plan

The sample pool for this study was from a WBT teacher group. Teachers who participated in this teacher group at the time of this study used WBT systems, so all participants were experienced with WBT systems. The sample size was 11 participants. Creswell and Poth (2018) explained that 10-15 participants who experience the phenomenon can be utilized. However, with a phenomenological study, the general focus is to collect enough rich accounts of the phenomena to reach saturation of themes (Moustakas, 1994).

This purposeful criterion sampling of people who have experienced the phenomena of utilizing WBT enabled me to select participants who have utilized WBT in their classrooms for at least one year (Creswell & Poth, 2018). Participants were contacted through the teacher group by posting a demographic survey. Participants were asked to return surveys within a week of posting on the teacher group. I contacted all eligible participants by email to schedule interview times. There were multiple time slots for focus groups. I asked participants to select two timeslots out of five. Using the data from the demographic survey, I chose participants from many experience levels, backgrounds, and ages. Moustakas (1994) explained that the participant

criteria included participant experience with the phenomena, keen interest in the phenomena, and willingness to participate in interviews.

Researcher's Positionality

This section discusses the importance of understanding my philosophy, emphasizing that my worldview shapes how I interpret data. The philosophical assumptions section examines my Christian worldview, emphasizing that all reality and knowledge stems from God's will and how this belief influences the research process. The importance of objectivity and transparency in interpreting data, despite personal beliefs and experiences with WBT methods, is explained in the researcher's role section.

Interpretive Framework

Qualitative researchers must understand their philosophy, for they are the instrument that will measure the data from interviewees (Creswell & Poth, 2018). Creswell and Poth expressed that an interpretive framework is what the researcher believes and contributes to the research process. Investigating my philosophical ideas, I considered cause and effect. For example, a teacher utilizes a specific instructional strategy, and the student results indicate whether it is valuable at that time. Logical steps can be investigated to understand a phenomenon connected with a postpositivist. However, I also connected with the constructivist worldview. I am thrilled to comprehend or construct a meaning to what is happening. For example, I wanted to determine if elementary teachers utilized brain-based learning strategies consistently. If we know from research that brain-based learning strategies are effective, how are they used in classrooms? A researcher's philosophies are essential to understand and define so one can know how they are communicated throughout a study. A researcher must distinguish their philosophical assumptions before research.

Philosophical Assumptions

As a Christian, my worldview is that God is in control of this earth age and all that has ever been and will be. Humans and all things on Earth are here for God's pleasure. Revelation 4:11 states, "Thou art worthy, O Lord, to receive glory and honour and power: for thou hast created all things, and for thy pleasure they are and were created" (*Holy Bible King James Version*, 1930/2016). God is all things, and I must learn from His guidance and instruction. I am constantly thankful for my surroundings and how God puts us all where we are needed. I work at a 3-5 elementary school, and our mission statement reads, "Working together with our families and military community, we are dedicated to inspiring a love of learning where students grow to reach their fullest potential." I work and learn with amazing people, seeing God's glory everywhere. This mission statement engulfs the beauty of God's children. We are here for God's pleasure, and He wants us to enjoy the learning and experiences He provides us.

Ontological Assumption

The ontological assumption asks the researcher about their beliefs on the nature of reality (Creswell & Poth, 2018). I believe that all reality is connected to God's will. When I look to God for all things in my life, the experience always goes the way it should, whether I understand that or not. I must always know that the LORD is my reality. Proverbs 3:5-6 states, "Trust in the LORD with all thine heart; and learn not unto thine own understanding. In all thy ways acknowledge him, and he shall direct thy paths" (*Holy Bible King James Version*, 1930/2016). God owns the nature of reality. My views honor the Word of God and the thoughts that all humans are here for the LORD's pleasure. This is the one universal reality that encompasses my thoughts and how I view the world. My view that all reality is connected to God's will is related to this study because understanding teachers' perspectives about WBT may aid other teachers

and stakeholders with their journey within God's plan, learning, growing, and improving. People can live and navigate in one universal reality while having different perspectives. My job as a researcher is to report on various perspectives and find common themes.

Epistemological Assumption

The epistemological assumption is determining what knowledge is, how claims are justified, and the relationship between the research and the researcher (Creswell & Poth, 2018). My view on knowledge is that all wisdom/knowledge comes from God. Proverbs 2:6 states, "For the LORD giveth wisdom: out of his mouth cometh knowledge and understanding (*Holy Bible King James Version*, 1930/2016). A researcher picks the study to investigate the phenomenon and acquire new knowledge unbiasedly. Before I can analyze or understand anyone else's point of view, I must realize my viewpoints on knowledge. I researched instructional and behavioral strategies and how teachers implemented them. I am a teacher, so I have knowledge of the topic. I understand my relationship with the topic, and gained new insight from this research.

Axiological Assumption

The axiological assumption describes the researcher's values that shape the interpretation of the study (Creswell & Poth, 2018). My values are represented through a Christian viewpoint, and God guides me. Although I am an elementary teacher and will be researching instructional and behavioral strategies, my outlook did not influence the study. I reported on the facts as they were presented to me. My interpretation of these facts was determined from the data I collected by finding themes unbiasedly. I believe in the importance of transparent evaluation, noting my thoughts and processes throughout the process. My assumptions revolved around my teaching experiences, knowledge of God, and my Christian worldview.

Researcher's Role

As the researcher, I am the human instrument of this study. My interaction with the study's participants stems from earlier Zoom sessions in which I participated as part of professional development training. I had no connection to participants besides utilizing the WBT strategies. I am currently using WBT methods in my classroom. I have struggled with classroom management and whole-class instructional engagement. My role in this study was to investigate the usage of the WBT method and how teachers interpret the meaning of this experience. With consistent use of the WBT methods, teachers' classroom experience will be highly effective. As I currently utilize some WBT strategies within my classroom, I overcame the biases and assumptions formed from my experiences with the WBT systems.

Procedures

This research topic is based on WBT and how teachers perceive and interact with this teaching method. WBT is a system that rewards student improvement, utilizes a game-based system, and integrates character education throughout the day (Biffle, 2018). Van Manen (2014) noted that data interpretation allows the researcher to analyze the lived experience. The three data collection methods used for this hermeneutic phenomenology study on the experiences of WBT are interviews, journal prompts, and focus groups.

Data Collection Plan

This study began with the approval of the proposal obtained from Liberty University's Institutional Review Board (Appendix A). I began recruiting participants for the study by emailing an interest survey (Appendix D) to the WBT teacher group. All research participants were contacted through the WBT teacher group and received a recruitment letter (Appendix C). Executive board members granted permission via email (Appendix B) to utilize the WBT teacher

group to email participants (see Appendix B, C, and E). Once participants were acquired, I emailed each participant (Appendix E) to schedule individual Zoom interviews. I conducted interviews first to allow me to embrace the lived experiences. Next, I emailed journal prompts to the participants directly after the individual interviews to reveal more common themes and finish data collection with a focus group interview. This enabled me to identify commonalities with all data collection methods. The focus group was scheduled through email for a Zoom interview with the group.

Individual Interviews

Individual interviews are a data collection strategy to explore the lived experience of individuals who have encountered the phenomena (van Manen, 2014). Data-interpreting interviews will allow the researcher to seek assistance interpreting the lived experience. Creswell and Poth (2018) noted that data collection should be appropriate for the participants. The rationale for using interviews is that I asked various teachers from around the United States of America who have all experienced the phenomenon. The interviews were completed via Zoom. Conducting interviews via Zoom allowed the participants to choose the most comfortable environment (the when and where) to meet their needs. The Zoom conferences were recorded, and a second recording system, 360 Writer-Voice Recorder, was utilized. Interviews allowed me to gain multiple perspectives from individuals across the United States.

Table 1

Individual Interview Questions

1. Please explain your journey of becoming a teacher. When did you know you wanted to be a teacher?
2. How did you first become familiar with Whole Brain Teaching? CRQ

3. What led you to try Whole Brain Teaching in your classroom? CRQ
4. How have you implemented Whole Brain Teaching in your classroom? CRQ
5. How have your students responded to Whole Brain Teaching? SQ1
6. How has Whole Brain Teaching changed your teaching practice? SQ2
7. Can you give an example of how Whole Brain Teaching has impacted a specific lesson or activity in your classroom? SQ2
8. How has Whole Brain Teaching impacted student engagement and motivation in your classroom? SQ1
9. Have you noticed any changes in student behavior or academic performance since implementing Whole Brain Teaching? SQ1
10. How have you collaborated with other teachers or administrators to support the implementation of Whole Brain Teaching? SQ2
11. How have you adapted Whole Brain Teaching to meet the unique needs and abilities of your students? SQ1
12. Have you received any professional development or support in using Whole Brain Teaching? SQ2
13. How have you incorporated Whole Brain Teaching into lesson planning and preparation? SQ2
14. Have you noticed changes in your stress or workload due to using Whole Brain Teaching? CRQ
15. Have you, and if so, how have you involved parents and families in incorporating Whole Brain Teaching in your classroom? CRQ

16. Have you noticed any changes in student learning when comparing Whole Brain Teaching to other teaching methods you have used? CRQ
17. How do you see Whole Brain Teaching merging into the culture and goals of your school? CRQ
18. How have you integrated student feedback into your use of Whole Brain Teaching? SQ2
19. Have you noticed challenges in using Whole Brain Teaching, and how have you overcome those challenges? CRQ
20. How have you grown in understanding and using Whole Brain Teaching since you started using it? CRQ
21. What advice would you give other teachers interested in using Whole Brain Teaching in their classrooms? CRQ

The interview questions are identified to answer either the central research question, sub-question one, or sub-question two of this study. Question one is meant to establish a positive bond between the interviewer and the participant (Bruijns et al., 2019). Questions two, three, and four address the central research question, which aims to identify how teachers experience and understand the implementations of utilizing WBT Methods. These questions focus on participants' specific experiences. Questions fourteen, fifteen, sixteen, seventeen, nineteen, twenty, and twenty-one align with the central research question because they aim to discover the experiences of incorporating WBT. Questions five, eight, nine, and eleven relate to knowledge questions attached to sub-question one, seeking to determine how WBT impacts teachers' pedagogy. At the same time, questions six, seven, ten, twelve, and thirteen address sub-question two, which looks to determine how teachers view WBT's effects on the student's learning experience and how they adapt WBT strategies to meet student needs.

Journal Prompts

This study's second data collection method was journal prompts completed by participants. Van Manen (2014) noted the importance of reflective practice. Creswell and Poth (2018) expressed the rationale for using journal prompts as data collection as a legitimate and standard form of data collection for an in-depth study. Journal prompts allowed the participants more time to respond to questions in a familiar environment. Participants were asked to write reflections guided by prompts directly after the individual interviews were completed through Zoom. Participants were asked to keep their journal reflections 200-400 words for each prompt and as a typed Word document. I sent journal prompts via email and asked participants to return reflection prompts by email within a week. After three days of the individual interviews, I sent follow-up reminder emails to request journal entries. Journal prompts were acquired from each participant.

Van Manen (2014) expressed that writing a phenomenology is a complete reflective process that expresses life experiences as they are being lived. Interviews, focus groups, and journal prompts were completed utilizing Zoom and email communication. These methods were creative ways to immerse the researcher in the topic. Moustakas (1994) noted that evidence from phenomenological research is accumulated through first-person reports of life experiences. These data collection methods aided in gaining insight and a philosophical view of this shared phenomenon.

Table 2

Journal Prompt Questions

1. Please reflect on your experiences with Whole Brain Teaching. What meanings and perspectives have you attached to these experiences? (Feelings, effectiveness, emotions,

etc.) How have these ideas shaped your perception of the effectiveness of utilizing WBT in your classroom? CRQ

2. Please explain if your usage of WBT strategies has allowed you to learn about how your students' brains learn best. How do you see a difference in your student's engagement with you and the lessons you are teaching in comparison to your teaching before you started utilizing WBT strategies? SQ3

Journal prompt one relates to the central research question by focusing on the teachers' feelings reflected in their WBT experiences. Journal prompt two reflects on sub-question two by asking how teachers understanding of WBT has adapted within their classrooms and how it affects their teaching style and students' learning processes. These journal prompts encouraged participants to explore their experiences, perspectives, and insights related to WBT. Their responses provided rich qualitative data that contributed to the depth and understanding of this research.

Focus Groups

Focus group data collection allowed for more information about this lived experience within a group setting (Creswell & Poth, 2018). Van Manen (2014) explained that it is good practice to elicit specific experiences when working with interviewees. The focus group ensures that the combined insights gained are rich in detail and grounded in the authentic experiences of the participants. This data collection method was also completed via Zoom. A focus group was engaging and allowed the researcher to observe the group dynamic of the conversations about the lived experiences of WBT. Utilizing a focus group allowed for more open exchanges about the topic. Preparation and conducting of individual and focus group interviews followed the steps and interview protocols: transcription and review, uploading the data into the ATLAS software,

utilizing the three coding approaches, and reflective writing. I triangulated this data using conceptual analysis with the individual interview and journal prompt data.

Table 3

Focus Group Questions

1. What are your favorite parts of Whole Brain Teaching in your classroom and why? CRQ
2. Please explain if you use some aspects of Whole Brain Teaching instead of others and why. CRQ
3. What have been some of the most successful aspects of Whole Brain Teaching in your classroom that you use now but did not use when you first started using Whole Brain Teaching? CRQ
4. How have your students responded to Whole Brain Teaching? SQ2
5. Why would some students not participate in Whole Brain Teaching games? SQ2
6. How have you addressed students who do not buy into Whole Brain Teaching? SQ2
7. How has Whole Brain Teaching changed your teaching practice? SQ1
8. How has Whole Brain Teaching aided you in elevating and evolving your view of student learning? SQ2
9. How has the delivery of your lessons changed? SQ1
10. How would you explain Whole Brain Teaching to a novice teacher? CRQ
11. What misconceptions have students, teachers, or families expressed about Whole Brain Teaching? SQ1
12. How do you see Whole Brain Teaching impacting education in the future? CRQ

Focus group questions one, two, three, ten, and twelve are identified to answer the central research question by delving into teachers' perceptions of the WBT system. Focus questions seven, nine, and eleven centered on sub-question one by discovering the challenges and successes teachers encounter with WBT. Questions four, five, six, and eight are anchored around sub-question two, seeking to understand how teachers adapt and modify WBT to meet teacher and student needs.

Data Analysis

Data analysis began with the interview transcription using the 360 Writer recorder app. I next reviewed the transcription for accuracy and did member checks by returning the transcript to the participants to ensure accuracy. After that, all interviews were uploaded into ATLAS software, which was utilized to store and access all data for this qualitative study. The ATLAS software allowed the researcher to secure and code the raw data. Three coding approaches were utilized on the interview data. The researcher applied holistic, selective, and detailed reading approach coding (Van Manen, 2014). Holistic reading is gathering the essence of all the interview data. I read all the data and formed a central idea. Van Manen stated that to conduct a selective reading, one must read the text several times and ask, “What statement(s) or phrase(s) seem particularly essential or revealing about the phenomenon or experience being described?” (p.320). I annotated the phrases that lend meaning to the phenomenon. The third round of analysis was a detailed reading approach to look at each sentence to find what that sentence reveals about the phenomenon being described. After coding all interviews with the three stated approaches, codes were formatted into themes by identifying recurrent patterns using clusters of codes. Then, I interpreted the meaning and essence of the experience by utilizing reflective

writing on the revealing themes. I triangulated this data using conceptual analysis with the focus group and journal prompts.

Next, all journal prompt reflections from participants were put into the ATLAS software. The ATLAS software allowed me to secure and code the participants' descriptive and reflective notes. Three coding approaches were also utilized on the journal prompts. The researcher applied holistic, selective, and detailed reading approach coding (Van Manen, 2014). After coding all journal prompt reflections with the three stated approaches, codes were formatted into themes by identifying recurrent patterns using clusters of codes. This process required me to read and re-read data collected from the journal prompts to determine how it related to the individual and focus group interviews. Then, I interpreted the meaning and essence of the experiences written by participants by following the steps and protocols: transcription and review, uploading the data into the ATLAS software, utilizing the three coding approaches, and reflective writing. This data was triangulated using conceptual analysis with the individual interview and focus group data.

Then, the focus group data analysis began with transcribing focus group interviews using a recorder app. The researcher reviewed the transcription for accuracy and did member checks by returning the transcriptions to the participants to ensure accuracy. Next, all transcripts were uploaded into ATLAS software, which was utilized to store and access all data for this qualitative study. The ATLAS software allowed the researcher to secure and code the raw data. Three coding approaches were utilized on the focus group interview data. The researcher applied holistic reading, selective reading, and detailed reading approach coding (Van Manen, 1990). After coding all interviews with the three stated approaches, codes were formatted into themes by identifying recurrent patterns using clusters of codes. Then, the researcher interpreted the meaning and essence of the experience. Preparation and conducting of individual and focus

group interviews followed the steps and interview protocols: transcription and review, uploading the data into the ATLAS software, utilizing the three coding approaches, and reflective writing. This data was triangulated using conceptual analysis with the individual interview and journal prompt data.

Finally, the triangulation of all data collection ensued. Van Manen (2014) explained that data is synthesized by the researcher writing to mesh together the collected data. Written reflection of all data collected allowed for understanding the phenomenon's essence. Writing and reflecting on the themes from each data source aided in synthesizing all three data methods. I combined all three data sets into one set and analyzed them by identifying codes from each data source, then formatting them into themes by identifying recurrent patterns using clusters of codes from all data sets. Then, the researcher interpreted the meaning and essence of the experience. Within this interpretation, the researcher kept the research questions at the forefront of the reflection. Van Manen explained that analysis should be guided by phenomenological questions.

Trustworthiness

This hermeneutic phenomenological study on the experiences of WBT includes data collection from interviews, focus groups, and journal prompts. The readers of this study will discern trustworthiness from the steps taken throughout all phases of the research. Schwandt et al. (2007) noted that when a researcher defends their interpretations successfully, they employ both trustworthiness and the authenticity of the data collection methods. This trustworthiness section explains the steps to secure a rigorous qualitative research study (Lincoln & Guba, 1985).

Credibility

Credibility was determined through rigorous planning and comprehensive data analysis processes. Lincoln and Guba (1985) explained that credibility details reality. The reality of this

study was revealed through data triangulation, peer debriefing, and member checks. Data collection methods included individual interviews, focus groups, and participant journal reflections to accurately reflect the phenomena of WBT. Every data collection method revealed a reality triangulated to show an overall theme. Peer debriefing provided the opportunity to communicate with colleagues about analysis and findings, allowing for insight from peers in the field. Finally, member checks were utilized throughout the research to review and verify transcripts. Journal reflection notes were sent to participants as well. Credibility is an important domain that ensured the internal validity of the research.

Transferability

External validity is the ability to recreate the results in other settings (Lincoln & Guba, 1985). Lincoln and Guba expressed that transferability suggests that the research outcomes can be appropriate in other instances. Researchers confirm transferability by presenting evidence that the findings are relevant to other circumstances, times, perspectives, and populations (Patton, 2015). I constructed a clear image of how teachers perceive and interact with the WBT method and what this means to my participants from descriptions I used to depict the experiences. The literature offered minimal insight into teachers' perspectives on this method, so this study provided insight into these perspectives that aid the education field in WBT effectiveness.

Dependability

Dependability demonstrates that the findings are consistent and repeatable (Lincoln & Guba, 1985). The researcher produced a detailed audit trail noting all procedures and planning, all data processes, findings, and the analysis processes. An audit trail ensured dependability. The procedures of this study are precisely detailed, and this study could be replicated. Descriptions of

the method developed for this study are clear, concise, and supported by the literature. The committee will carefully review these procedures and determine the chosen method's relevance.

Confirmability

Confirmability shows that the research results are not determined by conscious or unconscious bias, and results are relayed in a responsible representation. Lincoln and Guba (1985) stated that there is neutrality in confirmability. Triangulation is utilized to eliminate any bias from the researcher and expert review from a qualified researcher not participating in the research. Triangulation is a strategy within qualitative research to study validity by integrating information from different sources (Carter et al., 2014). The analysis was justified by reasons for each decision (Creswell & Poth, 2018). Confirmability was achieved by making all information available within the audit and available for peer and expert review.

Ethical Considerations

The ethical considerations for my qualitative research are of vital importance. I must ensure the well-being and safety of the participants. First, I wanted to inform participants that I have worked closely with the IRB, following their guidelines for conducting ethical research (Creswell & Poth, 2018). In addition, I obtained site permissions and consent forms for confidential participants. I obtained site permission through the teacher group to reach out to the group of participants for my study when that time came.

Permissions

This study began with the IRB approval. The IRB approval documentation is located in the appendix section. Additionally, permission via email was obtained to reach out to interviewees of the teacher group once the proposal was approved and IRB approval was

received. Once participants gave consent, interviews were acquired, and all documentation is listed in the appendix.

Other Participant Protections

Participants must feel they have the ability to speak openly and freely. I am the human instrument, and the participants must know they can trust my confidentiality by keeping electronic and physical data secure and utilizing pseudonyms within my writing. I stored all data on my personal password-protected computer. According to Creswell and Poth (2018), data storage must be secured for five years. My research has minimal risks; we discussed personal teaching strategies. Emotions such as anxiety, embarrassment, joy, among others, could be elevated. Finally, I evaluated any other potential issues, such as the participant's right to withdraw, which can arise and how that was addressed. I ensured that my research was conducted safely and responsibly by considering these ethical considerations.

Summary

This chapter included a design summary of a hermeneutic phenomenology study. An explanation is given as to why a hermeneutic phenomenology was utilized for understanding the experiences and perceptions of teachers who use WBT, as well as how teachers interpret and make sense of their experience to shape their teaching and their student's learning growth of the whole child for 10-15 participants from various schools across the United States. The research questions, setting and participants, and research's positionality are described. The procedures, data collection plan, and the steps of data analysis were outlined, as well as a trustworthiness section. This chapter ends with a discussion about the ethical considerations of this study.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this hermeneutic phenomenology study was to understand WBT through the experiences and perceptions of teachers who utilize this system in the United States. This chapter includes the participant's educational background and provides insight that identified three key themes that include (a) transformation in teaching and classroom dynamics with WBT, (b) impact on academics and behavior management with WBT strategies, and (c) personal growth and professional fulfillment. This chapter highlights the themes and subthemes while answering the central research question and sub-questions. The chapter concludes with a summary that illustrates the chapter's central insights and sets up for the in-depth discussion in Chapter Five.

Participants

For the study, I recruited 11 participants from a WBT teacher group. The participants are from various United States schools and content areas, including special/resource education, general education, and intervention specialists. They have at least one year of experience using the WBT system and at least three years of teaching overall. Table 5 illustrates the participants' demographic details, including their years taught, level of WBT certification, and grade level.

Mary

Mary is an elementary teacher in the Southeast region of the United States. She has taught for over 10 years and started teaching after college. Mary left teaching for some years to have a family and pursue other work, then returned to the classroom. Teaching students to read and write was Mary’s passion. She has a love of learning and has currently completed all Whole Brain Teaching certifications. Mary has had many professional developments and certifications:

bachelor's degree, Institute in Basic Youth Conflicts, Teachers' and Principals' Clinics and Summer Seminars, Pensacola Christian College, Christian Educators Association of the Southeast Convention Florida Association of Christian Schools Convention, National Christian Educators Convention, Hyles-Anderson College, ACE Christian Educators' Conventions, and teacher of the year, 2021-2022.

Liz

Liz started teaching by substituting at her children's school, which she enjoyed. She decided to turn this joy into a career and became a certified teacher. Liz has been teaching for four years. She teaches at the elementary level in the Southwest United States. Liz thoroughly enjoys sharing teaching knowledge and collaborating with others. Liz is currently silver-certified in WBT. Silver certification in WBT requires completing five modules, including essays and quizzes on the WBT systems and learning about the brain. Liz has a bachelor's and master's degree.

Jane

Jane always knew she wanted to be a teacher, even as a child. She has been teaching and using parts of WBT for over 10 years. Jane teaches elementary students in the Midwest region of the United States and has completed all WBT certifications. She has a master's degree in special education.

Matthew

Matthew works with elementary students in the Western United States region. Matthew is a platinum-certified WBT who has completed all certification processes. Matthew has taught for over 10 years, and his community has documented his dedication to education. He is certified to teach band, choir, and orchestra Pre-K through 12th grade. He has World Music Drumming level

1 certification and First Steps in Music and Conversational Solfege certification. He has a bachelor's and master's degree. Matthew has been music educator of the year twice, was the teacher of the year in 2023, and was WBT's teacher of the year in 2023.

Bailey

Bailey has worked in the educational field for over ten years, working with learners of all ages, from pre-K to adults. Bailey has completed all WBT certifications and is a platinum-certified WBT. She has a master's degree and a master's in education degree. Bailey has earned multiple school awards for music excellence and has had numerous students win regional and international awards for music. She also carries the Legion of Light award from Kappa Phi and Excellence in Commitment to Christian Service. Bailey lives and works in the Midwest region of the United States.

Joy

Joy lives and works in the Southeast region of the United States. She has worked with elementary students for over 10 years and utilized WBT strategies for four years. Joy has a master's degree, completed all WBT certifications, and is certified platinum. She is also a Seesaw-certified educator and teacher of the year.

Melissa

Melissa has been teaching for over 10 years and has a master's degree in special education. She currently works with elementary students in the Midwest region of the United States. Melissa discovered WBT after meeting her daughter's teacher; she strongly desired to learn WBT, wanting to learn more, jumping right in to complete all WBT certification requirements. She is a platinum-certified teacher.

Lena

Lena has two bachelor's degrees and is silver-certified in WBT. She has been teaching for over 10 years and works with elementary students. Lena has an English learner authorization and cross-cultural, language, and academic development (CLAD) certification. She also has a Teaching English to Speakers of Other Languages (TESOL) certificate and is certified in SMARTER Intervention Training. She lives and works in the Western United States region.

Tara

Tara lives and works in the Southeast region of the United States and has been teaching for seven years. She works with elementary students and has her gold WBT certification. She has an educational specialist degree in special education administration, is an executive functioning educator, is a trauma-informed educator, and is a behavior support specialist.

Gale

Gale works in elementary education in the Southeast region of the United States. She recently acquired a silver certification in WBT and has been a teacher for over ten years. Gale has taught K-6 grades and homeschooled. She has a bachelor's degree and is CLAD certified. Gale has also completed language essentials for teachers of reading and spelling training (LETRS).

Kelsey

Kelsey has been teaching for 10 years and is silver-certified in WBT. She lives and works in the Southeast United States. She has a master's degree in instructional technology- library media specialist. Kelsey's school and community have recognized her dedication to her students and her personal growth and improvements as a teacher.

Table 4

Teacher Participants

Teacher Participant	Years Taught	WBT Certification Level	Grade Level
Mary	10+	Platinum	K-5
Liz	3-5	Silver	K-5
Jane	10+	Platinum	K-5
Matthew	10+	Platinum	K-5
Bailey	10+	Platinum	K-5
Joy	10+	Platinum	K-5
Melissa	10+	Platinum	K-5
Lena	10+	Silver	K-5
Tara	10+	Gold	K-5
Gale	10+	Silver	K-5
Kelsey	10+	Silver	K-5

Results

During the virtual interviews, journal prompt responses, and focus group, participants shared their experiences using WBT and how their experiences and perceptions shape their teaching practice. From the data analysis, three themes emerged: transformation in teaching and classroom dynamics with WBT, influence on academics and behavior management with WBT strategies, and personal growth and professional fulfillment. Each theme was supported by subthemes uncovered during clustering. Participants shared their experiences and how their experiences with WBT influenced their teaching practice.

Table 5

Themes & Subthemes

Theme	Subthemes		
Transformation in Teaching and Classroom Dynamics with WBT	Teaching Joy	Influence on Classroom Environment	Connections
Influence on Academics and Behavior Management with WBT Strategies	Brain-Based Learning	Strategies for Student Engagement	Growth and Improvement
Personal Growth and Professional Fulfillment	Rejuvenation	Integration and Evolution	Professional Environment and Resources

Transformation in Teaching and Classroom Dynamics with WBT

Participants unanimously commented that WBT has transformed their teaching practices and classroom dynamics by rediscovering the joy and fun in teaching, enhancing student engagement and behavior, and fostering strong connections. Melissa stated, “I saw increased engagement, increased student growth, stronger connections with my students, and an overall transformation in myself and my students.” The participants were all adamant about the transformation WBT contributed to their renewed joy in their classrooms. These teachers discussed how WBT strategies transformed dysregulated students into willing classroom

participants. WBT strategies were considered to be the link in classroom connections between students and teachers. Lena expressed the importance of the classroom dynamic:

> Whole-brain teaching strategies have not just improved student engagement; they have revolutionized my classroom dynamics. They have empowered my students to take ownership of their learning, making every lesson a collaborative and enriching experience. Thanks to WBT, my students are more focused, attentive, and enthusiastic about learning.

Elements of transformation in teaching and classroom dynamics with WBT appeared in some form across all three data sources.

Teaching Joy

Adopting WBT has given teachers a positive perception of their abilities in teaching by transforming their classrooms into joyful learning spaces. Kelsey explained, “I am having fun, and my class is fun!” Kelsey credits WBT strategies for her enjoyment of teaching. Joy shared that she had told her husband she was done with teaching, and then she found WBT and found her passion for teaching again. Mary stated, “My experience with WBT has been relatively short—two years—but it has totally changed my teaching life. I no longer dread Monday mornings, returning after a break or even the first day of school.” When Bailey started using WBT, she shared that she had watched many WBT videos and decided she wanted her classroom to run as smoothly as she had seen. Bailey began using oral writing and other WBT strategies, expressing, “I thought, oh my gosh, this works. This really, really works. All the strategies really, really work!” WBT has provided joy in these participants' classrooms.

WBT has changed teachers' perspectives of what their classroom should be. Joy expressed, “The way I teach now, with WBT, makes sense for student engagement and learning

as well as less chance for teacher burnout as I have so much fun with my students and don't go home exhausted from scolding daily." Gale's journal prompt explained:

> I like to have fun and be silly with my class. WBT allowed the fun side to flourish while still getting the curriculum into their brains. My class the following year was the happiest class I have had in a long time. It was a complete reversal of the previous year. Not only was my classroom happy and fun, I could leave school at a decent time and be happy at home instead of carrying the weariness and frustration with me.

Teachers note the importance of a happy classroom. Jane expressed how WBT saved her, "The kids didn't want to be there; WBT saved me and my career." Jane explained that the kids loved WBT and that it was fun. Jane shared, "I felt like a weight lifted off my shoulders. I felt amazing, and I had fun. WBT brought the fun back." Gale speaks to the multitude of feelings with teaching and how WBT aids with the load; she explained, "To be one of the few joyful teachers means a lot to me. Teachers should not feel so heavily burdened, but it is becoming a much tougher job between all the paperwork requirements and misbehaviors nowadays." Gale went on to express how she sees many teachers walking with frowns on their faces while she can have a smile on her face because of her WBT strategies.

Teachers have experienced a renewed sense of purpose and excitement using WBT. Melissa stated, "Whole Brain Teaching truly brought back my passion for teaching by providing me an outlet to level the playing field for my students, who are already performing behind their peers in many ways." Teaching is challenging; having helpful tools to navigate it can be a joy. Kelsey explained that before WBT, she thought that some of her challenging students might not like her, but she now realizes that the most challenging students need her the most. She expressed that she now has many strategies to choose from to help those students and that she

feels like a better teacher. The codes of positive feedback, positive interpretations, and perception of success were clustered to form the sub-theme of teaching joy. These codes appeared 205 times in participant interview transcripts, journal prompts, and the focus group transcript.

Influence on Classroom Environment

Implementing WBT in the participant's classrooms has led to significant positive changes in student behavior and engagement within the classroom environment. Tara explained that her group of students before WBT were only successful behaviorally when they were on the iPads. Since she uses WBT with these students, she does not allow iPads or electronics for engagement. Tara uses the WBT systems, and her students are successful every day. Gale expressed that her class seemed happier than the rest of the school. Gale shared, “We’re supportive of each other, they encourage each other, and they clap for each other.” Participants acknowledged that consistent WBT strategies improved focus and reduced behavioral issues. Tara explained that connections are always essential to improving behaviors, but she shared, “So, the turning point in class—I mean, yes, it was making connections—but what gets them is that they're able to be super engaged with WBT.” Tara stated the importance of engaging students’ whole brains, “They don't have as much time to engage in a bunch of poor behaviors because I'm constantly engaging them with the motions and the dice rolls.”

Teachers observe that when they maintain high energy levels and enthusiasm using WBT elements, their students respond with improved behavior and performance, creating a more productive and harmonious classroom atmosphere. Jane expressed, “My experiences with WBT have excited me and given me hope about my teaching. On days I don’t use the techniques, I feel a difference in myself and the students. Neither of us is engaged or focusing on our best.” Jane

discussed days when she says she is too tired to do a WBT lesson and that students will work independently. She notes that she becomes uninterested in her class and then switches back to WBT teaching, revitalizing her day. WBT allows for an enjoyable teacher and student experience. Participants found that using WBT positively impacted student needs and the classroom learning environment. Lena discussed integrating fun elements and targeted WBT strategies to foster a lively and engaging classroom atmosphere, significantly improving student understanding and memory. Lena stated, “Overall, Whole Brain Teaching has been a game-changer in my classroom, and I highly recommend it to my fellow educators.”

When students are dysregulated, and classroom environments are chaotic, it can be difficult for students to learn and teachers to teach. Liz explained that she leaned into WBT because it gave her a handle on classroom management and a calmer environment. Liz said, “WBT helped me become confident in managing a tough classroom.” Ensuring the classroom environment is conducive to learning is vital for student growth and improvement. Matthew talks about improvements for everyone in a classroom. He expressed that WBT is fundamentally about encouraging continuous improvement for everyone. This approach shifted his perspective; when he felt frustrated with student behavior, Matthew recognized it was because he was pushing them beyond their readiness. Understanding this fact helped him adjust his approach. Matthew said, “I need to change my lens so that we both can grow and grow together as a class.” The codes of learning environment, student needs, and classroom interpretation were clustered to form the sub-theme of influence on classroom environment. These codes appeared 160 times in participant interview transcripts, journal prompts, and the focus group transcript.

Connections

All teachers agreed that one of the most successful approaches to transforming their teaching and classroom dynamics was to use WBT strategies to form and build strong connections. WBT emphasizes the importance of building strong connections between teachers and students, students and students, and students and themselves. Matthew stated, “The class community must always be kept in check, like a garden. It needs to be watered, pruned, and nourished.” Matthew discussed how WBT incorporates various games throughout the year, each designed to promote class unity and a sense of community. Feeling secure in this environment enables students to excel while feeling unsafe hinders their willingness to take risks. Therefore, teachers must prioritize building a strong class community.

The focus on relationship-building, a cornerstone of effective teaching and learning, is a source of immense joy and fulfillment. Joy shared, “One of the most impactful aspects of WBT is the focus on connecting with students.” She further expressed that while she always connected well with her students, WBT strategies have allowed her to deepen those connections and teach students to communicate with each other. The joy she experiences in observing students demonstrate kindness, manners, and respect toward one another is a testament to the effectiveness of WBT.

Rather than just managing behavior, WBT strategies support teachers in celebrating student growth and improvement. Liz shared, “I have always had a heart for those tough kids and had big relationships with them, but WBT has given me tools to dive deeper and to stick with it and not get bogged down by how hard it can be to work with the tough kids.” Focusing on connections helps implement a supportive and motivating environment where students are encouraged to strive for continuous improvement. Mary expressed, “WBT has taught me to ‘only

connect.' These connections have given me an environment that allows me to interact with students in a way I never did before." Mary is invested in her students and strives to keep making connections. Mary stated, "I don't want to let them down, and more and more, they don't want to let me down. We have truly become a 'dear team.'" This sense of accomplishment and pride in her student's growth and improvement indicates the success of WBT strategies and the value they bring to her role as an educator.

Connections in a classroom are critical to a smooth-running classroom. Matthew noted the importance of connections within lessons and self-reflection. Matthew shared, "Through every lesson, I looked for ways to help my students connect with each other and with our community." Matthew explained that instead of focusing on arguments and discipline, his class worked on strengthening their team. Matthew noted that despite bad days and imperfections, WBT helped him concentrate on the positives and areas for improvement. Matthew explained how the WBT approach emphasized connecting with all students, even those he did not easily align with, making him more reflective and less reactive. WBT has pushed Matthew to be prepared, present, and give his best, supporting mutual growth between his students and himself. Matthew said, "When I'm growing, my students are growing." The codes of connections with students, relationships, and deeper connections were clustered to form the sub-theme of connections. These codes appeared 136 times in participant interview transcripts, journal prompts, and the focus group transcript.

Influence on Academics and Behavior Management with WBT Strategies

Participants unanimously discussed the importance of utilizing WBT brain-based teaching methods, strategies for student engagement, and the observation that WBT enhances academic growth and positively transforms student behavior. Mary stated, "WBT could be the

salvation of the school education system." Kelsey shared, "I want WBT to sweep the world because it has changed my life, my classroom, and my students as well." WBT can significantly influence the classroom when teachers utilize various strategies; WBT encompasses behavioral and academic support. Liz expressed, "For me, so much of my experience with WBT has been dealing with classroom management. So, I know there are a lot of other elements to it, but that's really what turned my experience as a teacher around and why I am so committed to it now." Participants relied on WBT to aid with behavioral management techniques. Liz stated, "WBT has helped me become confident in managing a tough classroom." WBT is not only for classroom management improvements but also for academic success. Bailey explains, "WBT has really made the engagement of my students increase heavily; I am learning so much more brain science and have used this knowledge to form my lessons." Bailey discussed that with WBT's active approach, she can address every learning style, which she had always aimed to achieve but could not figure out before. WBT has transformed her lessons to engage even the shyest students, making a noticeable difference. Bailey explained that she struggled with traditional teaching methods, but discovering WBT and embracing non-traditional settings has revolutionized her teaching and learning.

The influence of WBT strategies on academics and behavior management was apparent in Tara's classroom. Tara stated, "Using WBT strategies allows me to successfully teach students who are unable to be in the general education classroom. These students have severe behaviors that are often aggressive or highly emotional." Tara went on to give some examples of behaviors she encounters regularly: punching, biting, scratching, high magnitude continuous screaming, self-harm, cursing, and choking people. Tara shared that these examples provide a glimpse, but more behaviors previously prevented these students from joining the general

education population. Tara talked about how the school community and staff have noted that using WBT strategies this year has transformed the experience for these students. Remarkably, Tara shared that there has not been a single day requiring the principals' intervention for severe behavioral issues due to the use of WBT. Tara explained that her class was not allowed to participate in field trips in the past, but this school year, because behaviors had improved so much, they were allowed to go, and every student could be safe and successful on the trip. Tara stated, “This all I credit to Whole Brain Teaching and the strategies involved in teaching these students.” Tara feels that to capture her students' focus, attention, and motivation, she utilized every WBT technique available, including the magic circle, AlphaHawk Island, Super Improver, and virtues, emphasizing connections and improvement over consequences and discipline. Tara discussed that without WBT, she would not have felt confident or capable of teaching her current students. Tara stated, “I have enjoyed excelling in giving these students chances they have never had before!” The impact of WBT strategies on academic and behavior management appeared across all three data sources, bringing about a hopeful change in the classroom.

Brain-Based Learning

Brain-based teaching practices through WBT have led these teachers to focus on implementing student-friendly learning techniques. Matthew stated, “WBT truly focuses on engaging as much of the brain as possible in each lesson.” Matthew expressed that each student has specific needs, and a WBT teacher must engage as many students as possible. When Matthew reflected on his teaching, he found that unsuccessful lessons were usually neither engaging nor developmentally appropriate. Matthew shared that the students are most engaged when the lesson hits their learning sweet spot—neither too easy nor too difficult. Matthew felt this balance is difficult to achieve with demanding standards, as pushing too hard can lead to

resistance and failure. Matthew believes that WBT allows immediate feedback on whether the material is appropriately challenging, enabling quick adjustments. Before WBT, Matthew often taught entire lessons before realizing the material was too easy or hard, leading to student disengagement and teacher frustration.

WBT combines brain-based learning techniques to aid teachers in keeping students' attention and the lesson on track. Gales stated, "One of the things I love most about WBT is the actual knowledge of how the brain works." When teachers know how to make research-based lessons, they feel they are reaching their students. Joy noted, "When starting WBT, I did the bronze certification and learned a little bit about how brains learn best. Sadly, that was never an emphasis in college during new teacher preparations." Joy explained, "I learned so much about how the brain naturally wanders and needs to have all parts firing in order for students to easily pay attention and learn concepts."

WBT emphasizes an instructional method utilizing all parts of the brain, the magic circle. Mary notes, "WBT's Magic Circle has given me a way to teach that allows me to know if learning has happened before a formal assessment. It has taught me to chunk my lesson plan into bite-sized pieces." Mary stressed the importance of how the brain learns, stating, "WBT has gotten me out of using the 'least effective way to learn' (Wernicke's Area) and into the whole brain. Each year I have taught the brain lesson to my students and invited their parents to sit in." Mary shared how she and her student's understanding of how different areas of the brain function has improved classroom scores and helped Mary re-engage students who lose focus during a lesson. This awareness is vital in maintaining student attention and enhancing overall performance.

Lena shared how WBT has transformed student performance by using brain-based strategies. Lena noted, “When I discovered Whole Brain Teaching, everything changed.” Lena explained, “Implementing Class-Yes became a game-changer. The simple call-and-response method immediately captured students' attention, returning them to focus with a collective *Yes!* It was incredible to witness how this technique activated their auditory processing and motor cortex, setting a positive tone for the lesson.” Lena expressed that incorporating mirror words into her lessons injected energy and enthusiasm. Lena explained that having students mirror her words with gestures made learning enjoyable and reinforced their grasp of essential concepts, boosting retention. Lena also talked about the teach/okay WBT strategy and how it was equally impactful; she could observe students teach each other after a short lesson segment, which was highly fulfilling. Lena noted that this approach stimulated their prefrontal cortex as they independently processed and organized information. She explained that peer interaction enriched their understanding and significantly enhanced their communication abilities. The codes of developmental appropriateness, teaching approach, and student-centered methods were clustered to form the sub-theme of brain-based learning. These codes appeared 177 times in participant interview transcripts, journal prompts, and the focus group transcript.

Strategies for Student Engagement

All teachers interviewed found that WBT strategies significantly enhance student engagement, motivation, and participation by utilizing interactive techniques, such as the magic circle, Super Improver, and dice rolls. Kelsey stated, “The thing that I love most about Whole Brain Teaching is the difference in student engagement. No longer is it okay for students to passively listen.” Kelsey expressed that the students who struggle with focusing can recall vocabulary and concepts better when incorporating gestures. She explained that the anticipation

of teaching their peers encourages students to be more attentive and engaged during instruction, ensuring they are actively present in their learning process.

Tara explained her experience before and after utilizing WBT strategies and instructional methods. “Before I started using WBT, I had lessons, but my students were not engaged. They struggled to remember what we had been learning and refused to participate most of the time.” Tara explained that even though she had different students this school year, she started seeing significant academic improvement and growth, which she had never seen before in her previous classroom of special education and behavior classes.

Joy shared that she had students return to her class and that her students’ parents commented on her WBT usage. “Students continued to visit me in my classroom and tell me how much they loved being in my classroom and loved the ‘games’ we always played.” Joy spoke about parent comments, saying, “I had a parent tell me last year that third grade just clicked.” She explained that she believed it was because of the gestures and mirror words as the child would go home and share what she learned in class. Joy stated, “This experience really stuck with me and made me realize how effective WBT is when it is used.” Joy believes that students solidify their learning by associating it with specific gestures. Through repeated practice and opportunities to teach their peers, they reinforce these concepts in their minds. Joy expressed that teaching others helps embed the information more deeply, making it easier for them to recall later.

The codes of increased focus, motivation, and engagement were clustered to form the sub-theme of strategies for student engagement. These codes appeared 174 times in participant interview transcripts, journal prompts, and the focus group transcript. WBT strategies have

effectively minimized disruptive behaviors and supported active learning, leading to notable academic growth and improved classroom dynamics.

Growth and Improvement

All participants noted a significant increase in student engagement and participation in lessons when using WBT, leading to noticeable improvements in academic performance and test scores. Utilizing strategies like the magic circle that chunks lesson plans have effectively added to student buy-in and created a supportive classroom environment that enhances student attitudes toward learning and school. Melissa shared that this school year, she had several students with specific learning disabilities, significant language impairments, and attention deficit hyperactivity disorder. Melissa found that using the magic circle components helped keep these students engaged and improved their focus and recall abilities. Melissa adapted her teaching approach to enhance student retention by breaking down concepts into smaller, more manageable chunks. Melissa found that encouraging students to teach each other effectively supported long-term skill retention throughout the year. Melissa explained that previously, students struggled to recall skills once they moved on from them, but WBT has helped improve this.

Melissa's incorporation and use of wonder words with corresponding gestures significantly aided her students' comprehension of *wh* questions and common goals in reading and speech therapy. Additionally, Melissa observed that competitive games highly motivate her students, regardless of difficulty, particularly those timed to beat their scores within 60 seconds. Melissa noted, "That short burst of adrenaline and dopamine was a game-changer in their learning. Carryover of skills is challenging for many students I work with, and with Whole Brain Teaching, I have seen students start to apply and carry over things they have learned in my small group setting."

Joy talked about WBT being a mind shift about teaching and students' behaviors, not perfect behavior, but improved behavior. Improvement is the base of all the WBT strategies. Bailey also said she wants her students to know she is looking for their growth and improvements throughout the year. Jane mentioned that she knows WBT works because she observes students using gestures on assessments. Jane explained that her students cannot wait to return tomorrow because they want to earn Super Improver stars. WBT celebrates improvements with various strategies, from Super Improver to the peace circle. The growth, improvement, and progress codes were clustered to form the sub-theme of growth and improvement. These codes appeared 167 times in participant interview transcripts, journal prompts, and the focus group transcript.

Personal Growth and Professional Fulfillment

The data collection indicates that using WBT strategies has transformed teachers' motivation and renewed their passion for teaching. Lena expressed that she may only have a few years left to teach. Still, she noted, “The students in our classrooms deserve the best instruction they can get, and it is important to continue on this path of professional learning.” Teachers enjoy utilizing WBT strategies and learning from and with like-minded teachers in the WBT community. Matthew shared, “My experience with WBT has been a journey of self-discovery and growth.” Kelsey stressed that WBT has allowed her to find positives in every day and every student. Joy also indicated the satisfaction from seeing positive student outcomes while experiencing a reduction of teacher burnout due to the enjoyable teaching methods of WBT.

Participants maintained enthusiasm and motivation despite challenges when utilizing WBT and felt a sense of professional fulfillment and sustained energy in the classroom. Kelsey shared, “I am so proud that I found WBT. Since becoming a WBT teacher, I have learned to look

on the bright side of things." Kelsey stated, "I've begun finding positives about every day and every student. I have been able to remember to pause and not take misbehaviors personally." Kelsey believed that she has become a significantly more effective and engaging teacher. She was recognized as her school teacher of the year and honored as teacher of the month. Kelsey also received a *Start Strong Classroom* award for social-emotional solid learning instruction. Kelsey attributes much of her success to the tools and strategies she has gained through WBT. All participants have stressed how WBT has revived their passion for teaching and given them a renewed sense of fulfillment in their student interactions.

Rejuvenation

Every participant expressed that they felt that with WBT methods, they had rediscovered their passion for teaching. Lena noted, "WBT has changed my effectiveness. I feel like a good teacher now, unlike before WBT, when I didn't." Mary shared that WBT transformed her teaching experience from dread to new excitement for teaching. Tara stated, "I love being a teacher now, and I don't question any day. I wake up every morning ready to come and make a difference in the lives of my students." Tara believes that despite the challenges she faces on difficult days, she is confident in her ability to succeed with her students, or any students, by employing WBT methods.

WBT has rejuvenated these teachers' beliefs in themselves and their abilities. Gale expressed, "Fortunately, I discovered WBT after an extremely frustrating and stressful year. If not, I might have been looking outside education for a job." Mary stated, "Before Whole Brain Teaching, I think I was snarky; now I feel like a nicer teacher." Matthew talked about not feeling like he was doing his best before WBT. He explained how he thought he was ineffective as a teacher and began losing his passion for education. He addressed that his teaching became

monotonous and unrewarding, lacking the challenge it once held. Once he discovered WBT, he was transformed, and it revitalized his teaching career. Matthew expressed that WBT is more than just strategies; it is a complete mindset shift. Matthew marks WBT as a rejuvenating experience, marked by a change in perspective, reducing stress, and renewed enthusiasm. The codes of teacher attitudes, stress, and revitalization were clustered to form the sub-theme of rejuvenation. These codes appeared 52 times in participant interview transcripts, journal prompts, and the focus group transcript.

Integration and Evolution

WBT is a tool that can be integrated into anyone's classroom. Some participants started integrating strategies slowly, while others used all the methods immediately. WBT can be integrated anytime during the school year, not just at the beginning. Jane was feeling frustrated with her class. She said, “I wasn’t getting through to them.” Halfway through the school year, she discovered WBT. She read the book and watched all the YouTube videos. She was all in when she returned after winter break, trying all the strategies. Jane said, “The kids loved it; it was so fun; I felt amazing!” Melissa shared that although she jumped right in with all the WBT strategies and WBT certifications, she found it best to go back and take each strategy step-by-step, then add more strategies over time. Mary explains the preparation, “Teaching Whole Brain Teaching is not a breeze. It's still hard—just a different kind of hard.” Mary explained that initially, teachers must invest more time preparing for class by breaking the lesson into smaller segments. She expressed that it becomes smoother and more manageable over time. Mary shared that letting go of the need to be the sole authority and allowing students to participate in reviewing content makes the process easier and more effective.

Gale explained that this year, she has learned more about WBT and implemented more; in turn, she can note the improvements in her class because of her WBT strategies. The WBT teaching strategies with the magic circle can aid teachers with planning and structure. Bailey said, “The five-step lesson plan made my life much easier.” Melissa explained that she would use some WBT strategies with students, and they would work for a while, then switch them to other WBT strategies. Melissa said, “It's really just been a learning curve and like knowing at the moment, well, that didn't work, so let's pull out a different tool.” Melissa also discussed incorporating and adapting elements like Super Improver to the school's existing tools like ClassDojo. The integration, strategy management, and evolution codes were clustered to form the sub-theme of integration and evolution. These codes appeared 78 times in participant interview transcripts, journal prompts, and the focus group transcript.

Professional Environment and Resources

WBT incorporates an online community to support and engage WBT teachers and teachers interested in learning new methods. Mary cheerfully noted that all professional development she has participated in with WBT has been free and worthwhile. All participants have engaged in some level of the certification process. Matthew said, “It wasn’t like I was just checking a box on certification but really thinking about what I was doing and how I was teaching my students.” Whole Brain Teaching played a significant role in rekindling enthusiasm and love for teaching, leading to these participants pursuing further WBT certification. Melissa obtained bronze, silver, and gold WBT certification within the first year of utilizing WBT, which demonstrates Melissa’s dedication to mastering the approach.

Bailey expressed the importance of professional growth and development in her music teaching. Bailey explained that using WBT allowed for her continuous learning and evolution in

music teaching practices through WBT certification and the application of strategies in diverse teaching roles. Kelsey mentioned her enthusiasm for professional growth with the weekly research and design meetings she attends with one of the creators of WBT, Coach Biffle. Kelsey said, “I want to be a part of these weekly Zooms forever! I feel like I can’t miss one!” WBT resources are free, and there is a website and Facebook groups. Mary expressed how amazing it is that all teachers can access WBT resources for free. Mary explained that there was nothing else like it. The codes of certification, teacher support, and resources were clustered to form the sub-theme of professional environment and resources. These codes appeared 67 times in participant interview transcripts, journal prompts, and the focus group transcript.

Research Question Responses

This study was designed to explore a central research question targeting interpretations of WBT experiences and perceptions of the WBT systems and three sub-questions. This section directly answers the central research question and the three sub-questions. The answers to the questions are based on the study data results and detailed in previous sections of the chapter. This chapter highlights the study’s findings and enables the discussion of further study analysis in Chapter Five.

Central Research Question

What are the perceptions of classroom success for teachers who use WBT systems? Teachers’ WBT experiences significantly influenced their perceptions of the system’s successes. All participants consistently reported improved student engagement, academic attainment, and positive progress in classroom behavior. These positive outcomes, in conjunction with their rejuvenated passion and professional fulfillment, strengthen their belief in the effectiveness and transformative potential of WBT in their classrooms. Joy shared:

> I will always use WBT in my classroom. It is effective, fun for students and teachers, and it teaches more than just academics; it teaches the whole child things they need to learn to be confident students and, eventually, respectful adults.

Teachers' interpretation of WBT is highly positive, attributing significant student growth and improved classroom behavior to implementing WBT techniques. Tara stated, "Not only does it feel good to see their behavior progress, but they're also making academic progress." Positive student feedback and noticeable improvements in behavior and academic engagement fortify teachers' confidence in the WBT system. Liz said, "I think Whole Brain Teaching helps me...makes me confident in managing a tough classroom." Bailey explained that WBT helped manage classroom behavior, increase student engagement, and enable a positive learning environment. For example, when working with a challenging second-grade class, Bailey found that WBT's methods allowed students to "feel good about themselves" and improved their academic performance and behavior, strengthening Bailey's belief in WBT's effectiveness.

Sub-Question One

How do teachers perceive the WBT system within their teaching method? Teachers perceive the WBT within their teaching method by reflecting on their teaching transformations, noting significant improvements in student engagement, behavior, and academic performance, and adjusting when needed. They credited their successes to the interactive and brain-based strategies of WBT, which contribute to their professional growth and their students' emotional and academic development. Liz expressed that the magic circle can be challenging, but she is committed. She explained that she likes having the accountability of the teacher group to help her overcome the challenges and do what is best for her students.

Teachers using WBT reflected on the challenges and successes of the WBT strategies in their classrooms by discussing its influence on their teaching methods and students' academic and emotional growth. Gale acknowledged difficulties, such as time management and curriculum requirements. For example, when a new curriculum required more structured time, she struggled to integrate all WBT elements smoothly. Still, she remained committed to using them where she could maintain a positive and engaging classroom environment because she knew WBT elements work. Participants also noted that students with attention difficulties, including ADHD, benefit significantly from the gestures used in WBT, which help them stay on task. The participants shared that reviewing the day's challenges often leads to identifying which WBT tools could improve the following day. Overall, the participant's experiences illuminate how WBT can be merged into their teaching method to reduce teacher stress, support student engagement and growth, and enable a collaborative educational environment.

Sub-Question Two

How do teachers understand how the WBT system fits their students' needs? Teachers understand that the WBT system can selectively incorporate strategies, such as the magic circle and Super Improver to align with their students' needs. Teachers understand they can modify WBT techniques to establish developmental appropriateness, actively engaging students and cultivating a supportive classroom environment that enhances learning and behavior. WBT teachers understand that WBT strategies can be adapted to work best for teachers. Kelsey described modifying the Super Improver system by doubling point values to motivate students, stating, "I was noticing a little dip in motivation, like the kids weren't caring as much, so I doubled all the point values." This adaptation helped re-engage students and incentivize improvement. Tara shared that working with special education students required her to modify

WBT strategies at various levels. She mentioned that with some things, she had to take it slower and do more repetitions to acquire specific skills. Tara expressed how having many WBT strategies allowed for various trial-and-error teaching practices. When one strategy did not work, she could try something else. Teachers adapt and modify the WBT system to fit their student needs through strategies and personal adjustments.

Teachers use WBT gestures to support math, grammar, and reading comprehension concepts, such as using gestures to practice the main idea, details, and cause and effect. However, some teachers might not integrate it as seamlessly into every subject. Lena noted, “It's been hard to integrate the magic circle with phonics.” Lena explained how she modifies some WBT strategies by putting the students in groups instead of pairs to practice the wonder words questions. The participants described how they personalize WBT to fit their unique classroom dynamics, often merging it with other educational strategies to maximize its effectiveness.

Sub-Question Three

How do teachers perceive students' knowledge retrieval when utilizing the WBT system? Teachers perceive students’ retrieval of knowledge using WBT systems by utilizing interactive strategies like Teach/Okay and the Magic Circle to assess and monitor student understanding in real time continuously. Teachers also track progress through tools like Super Improver stars, observing improvements in academic performance, retention, and student engagement. Jane stated,

> Being a science teacher, I must give directions a lot. I have found that students ask fewer clarifying questions or misuse the equipment when I give them directions using the magic circle. I have watched students retain science vocabulary words that are brand new to them throughout the entire school year.

Mary talked about using the teach/okay portion of the magic circle, a peer teaching strategy where students teach each other what they have just learned. The teach/okay portion serves as an immediate check for understanding and reinforces knowledge retention. Mary observes this student interaction to assess if students are grasping the material. "At the teach/okay, I can spot any problems and take more time to address them before they become compound problems."

Matthew explained the importance of measuring students' emotional well-being. He says using tools like the WBT fiver system, where students rate their emotional state, helps teachers quickly assess and respond to students' needs. "Fiver is so easy; they can just visually show you one to five where they're at." Matthew explained the significance of using a collective goal such as earning 100 staries. This engages students in a gamified learning process, both motivational and measurable. Overall, WBT systems provide a multifaceted approach to measuring student attainment, storage, and retrieval of knowledge, combining interactive strategies, continuous assessment, emotional well-being checks, and motivational tools to enable a comprehensive and engaging learning environment.

Summary

Participants have unanimously noted that WBT has transformed teaching practices and classroom dynamics by aiding teachers in rediscovering joy in teaching, enhancing student engagement and behavior, and strengthening solid connections. Teachers report a renewed feeling of purpose, with classrooms becoming joyful learning spaces and notable improvements in student behavior and academic performance. WBT strategies have cultivated more productive, amicable classrooms and strengthened teacher-student relationships. WBT's brain-based teaching practices and interactive techniques, like the magic circle, have improved focus and retention, supported engaged learning, and lowered disruptions. The WBT system has also rejuvenated

teachers' passion for teaching, reducing burnout and promoting professional fulfillment, while the supportive WBT community and accessible professional development resources have further enhanced its positive impact.

CHAPTER FIVE: CONCLUSION

Overview

The purpose of this hermeneutic phenomenology study was to understand Whole Brain Teaching (WBT) through the experiences and perceptions of teachers who utilize this system in the United States. This chapter begins with the interpretation of the study's findings. The chapter discusses implications for practice, theoretical and empirical implications, limitations, and delimitations, followed by recommendations for future research.

Discussion

This section discusses the three predominant themes from the triangulated data accumulated from interviews, journal responses, and a focus group. These themes consist of (a) transformation in teaching and classroom dynamics with WBT, (b) influence on academics and behavior management with WBT strategies, and (c) personal growth and professional fulfillment. Each theme correlates with the central research question, one or more sub-questions, or a mix of these questions. In this section, the analysis is correlated to outcomes and further related to a critical discussion, which outlines implications and recommends future research.

Summary of Thematic Findings

This chapter discussed three predominant themes revealed during the thematic analysis of the data through interviews, journal prompts, and a focus group. The lived experiences of 11 participants were formulated into data, and the following themes were revealed. These themes were a) transformation in teaching and classroom dynamics with WBT, (b) influence on academics and behavior management with WBT strategies, and (c) personal growth and professional fulfillment. The first theme of transformation in teaching and classroom dynamics with WBT dealt with how teachers, since finding WBT, had integrated the systems into their

classrooms. The theme highlights the renewed sense of teacher joy, student engagement, and connections within the classroom. The second theme was the influence on academics and behavior management with WBT strategies. This theme revealed how WBT brain-based strategies align with classroom student performance and growth. The last theme revealed was personal growth and professional fulfillment, which highlighted the importance of teachers feeling confident, utilizing WBT strategies that best fit each individual, and the critical importance of a supportive teacher community.

Interpretation of Findings

This section discusses my interpretations of the thematic findings. The participants' experiences and perceptions of the WBT systems were solidified into themes related to the central research question and the sub-questions. These findings reveal discoveries of the WBT system in the participants' classrooms.

Transformation

After analyzing the data, I have determined that WBT systems were a salvation to all participants. In other words, these teachers sought something to aid with change in their classrooms. The participants in this study agreed that WBT transformed their classroom dynamics for the better and made them happier as teachers. WBT transformed participants' teaching and brought them internal joy. I discovered that these teachers felt successful when implementing WBT. The participants positively interpreted feedback on their usage of WBT from colleagues and students, which gave them joy in their jobs. WBT changed the trajectory of their careers for all of the participants in a positive way.

All participants spoke of frustration or burnout in their classrooms before discovering WBT. The change they sought transpired after these participants learned and implemented the

WBT systems in their classrooms. I discovered that WBT teachers instill a foundation of fun routines that spark the brain in multiple ways. These routines create a new cognitive pathway in the brain for students to build from. Information Processing Theory (IPT) shows that students engage and encode new knowledge based on prior knowledge and cognitive schema (Atkinson & Shiffrin, 1968). These participants explained the importance of having WBT fun in their classrooms, which aided the students and teachers. WBT systems returned the passion of teaching back to these participants. Even teachers who were close to retiring are enthusiastic and determined to learn more about WBT strategies with renewed passions. These participants sought WBT professional development even after being fully WBT platinum certified. WBT systems spark a growth mindset in teachers of all levels and ages. I found that the WBT systems relieved these participants' feelings of frustration and burnout and replaced those feelings with confidence and pride in themselves and their students' accomplishments.

Connections

I determined that teachers regard the connections formed within the WBT system, whether student/student or teacher/student opportunities, as crucial to why teachers feel accomplished with the WBT system. WBT relies on connections as a foundation for its success. All participants spoke about the importance of the connections that WBT helps to create and maintain throughout the year to aid in a positive classroom dynamic. The literature supports the importance of teachers making solid connections with students. Hajovsky et al. (2023) found that positive teacher-student relationships and strong social skills lead to better behavioral and academic outcomes, enhancing the likelihood of a more favorable classroom environment. This data supports my findings, and I have determined from this study's data that the WBT components of teacher/student connections and student/student connections were paramount to

the success of the WBT systems. I found that the participants' classrooms run better when students directly engage in the fun WBT systems consistently with other students and the teacher.

The participants raved about how using WBT changed the entire dynamic of their classrooms, creating a happier place for both students and teachers. Kelsey explained that her school counselor conducts daily check-ins to gauge students' emotions, and the counselor compared this year's morning check-ins to last year's, noting that the students are much happier now. Kelsey credits the WBT strategies for this success. Information processing theory (IPT) relates to having a happy classroom environment because students are encoding the classroom environment, such as teacher/student relationships, student-to-student relationships, and how they feel about what they do all day. I discovered from this research that WBT provides learning in a fun way that incorporates positive social interactions for students to encode into their brains. IPT describes learning as a process involving encoding, transfer, and retrieval (Schunk, 2020). According to Brown et al. (2014), encoding involves transforming sensory perceptions into meaningful representations in the brain. I determined that WBT can aid with a happy and active sensory perception of the classroom environment, and the brain will register that positively, aiding in the transference of information to be learned in the classroom environment. Connection building within the WBT systems is a vital component of the success of WBT.

Fun Strategies

As well as making the time to incorporate the WBT strategies that rely on connections, I found that the teachers in this study credited their knowledge of how the brain can learn through fun and engaging games while rewarding for student improvement, not ability, as the critical components in WBT strategy success. WBT methods allow for an enormously fun learning

experience. Previous studies have shown the importance of promoting lessons in how the brain learns best while incorporating a positive emotional response (Greipl et al., 2021; Jensen & McConchie, 2020; Wardell et al., 2021). The guiding theory of this study, IPT, identifies how utilizing WBT methods, such as the magic circle, can contribute to academic success for students. Miller (1956), who introduced IPT, identified *chunking*, information as how the brain ultimately stores encoded information. The magic circle is based on chunking new information, using memory gestures, and collaborative learning. Medina (2008) noted the importance of utilizing various movement techniques, engaging emotions, and providing consistent feedback. I found from this research that the impact of using WBT strategies like the magic circle dramatically improved academic and behavioral learning.

This study sought to identify how teachers' interpretations of their WBT experiences affect their perceptions of the WBT system's success in their classrooms. These interpretations are based on the impact and outcomes of utilizing the WBT strategies. Many of the participants were seeking out support for behavior management when they found WBT. I found that WBT is a system that continuously aids behavior management while simultaneously utilizing instructional methods.

Implications for Practice

This section discusses the implications for practice based on teachers' experiences with WBT systems using the interpretations of the findings. Those recommendations include behavior management and teacher job satisfaction. By addressing these areas and utilizing the WBT systems, the recommendations aim to enrich classroom dynamics and contribute to a more positive and productive teaching environment.

The findings of this study suggest several practical implications that educators and school districts could consider. These implications may have various levels of application beyond the specific focus of this study. WBT's approach to behavior management, which integrates instructional methods with engaging and interactive techniques, may provide a strong base for supporting classroom management issues. Participants credited WBT systems with aiding them in managing student behavior more effectively while establishing a positive and enjoyable learning environment. This attention to behavior and instruction could be vital in many classroom settings where behavior management is a primary concern. The role of WBT systems in managing student behavior is a practical implication that educators and school districts should consider.

Implementing WBT systems appears to enhance teachers' motivation and job satisfaction significantly. All participants claimed a renewed passion and improvement in their teaching. This suggests that WBT could be an essential tool for reducing teacher burnout and promoting career retention. Although these outcomes were specific to the study's participants, other schools and districts might also find WBT strategies just as successful for teacher motivation and retention.

Empirical and Theoretical Implications

This section addressed the study's empirical and theoretical implications. The empirical implications are addressed by explaining the lived experience of WBT teachers. The theoretical implications of WBT coincide with Miller's (1956) information processing theory.

Empirical Implications

This study described the lived experiences and perceptions of WBT in the participant's classrooms by exploring their experiences with brain-based learning components of WBT, the active components of WBT, and participants' overall responses to utilizing the WBT systems.

Previous studies have helped identify ways to engage and teach students best in today's classrooms (Buchanan et al., 2021; Martella et al., 2020; McTighe & Willis, 2019;). However, there are limited studies that have focused on specifically WBT systems. This study's findings align with Rasmitadila et al. (2021), who identified that classroom instruction should be based on how the brain naturally learns. All participants explained how the WBT systems affect students' brains when interacting with the stimuli provided. Previous research also indicates that understanding and cultivating emotions is essential in planning and learning (LaVarco et al., 2022). The participants of this study unanimously indicated that the WBT systems center on connections, ensuring students' emotions are regulated.

The findings of this study align with research, indicating that body movements aid the memory systems of the brain's cognitive processes (Perikova et al., 2023). WBT instructional method, the magic circle, utilizes motion gestures to align with how the brain learns best. Participants credited the WBT magic circle instructional model as a success factor in their classrooms. Van Leeuwen and Janssen (2019) discovered that teachers who incorporate collaborative learning into their teaching models effectively use strategies for providing feedback, prompting questions, and transferring control of the learning process to their students. This study's findings revealed that the WBT magic circle instructional model allowed teachers to incorporate collaborative learning more than before they utilized WBT systems.

The results of this study aligned with Bana and Cranmore's (2019) finding that teachers who understand neuroscience are better equipped to handle student behaviors and academic concerns. Participants in this study indicated that understanding how the brain learns and regulates emotions allowed them to be better teachers. Participants noted the importance of

knowing that the brain's limbic system controls the prefrontal cortex. In other words, emotions control reasoning.

This study extends previous research on best practices in classrooms by providing a specific system that stimulates the prefrontal, motor, and visual cortex of the brain, including activating the Broca's and Wernicke area of the brain, as well as the limbic system, all into one instructional model. The participants of this study credit utilizing the WBT systems for their classroom success, professional growth, and fulfillment.

Theoretical Implications

The theoretical framework for this research is grounded in information processing theory (IPT), as established by George Miller (1956), a pioneer in cognitive psychology. Miller's theory, based on Edward Tolman's latent learning theory, emphasized the processes of encoding, transferring, and retrieving information (Çeliköz et al., 2019). This framework is essential for understanding the cognitive processes that stabilize effective teaching strategies. Miller's (1956) concept of *chunking* explains how the brain organizes and stores information in short-term memory, a principle that has significant implications for educational practices.

The findings of this study spotlight the importance of IPT in the context of WBT. Chunking important lesson points is a core concept of the WBT magic circle instructional model. Participants noted that WBT strategies involving active, student-centered learning significantly transformed their classroom dynamics and enhanced student engagement and academic outcomes. This aligns with the observations of Smith and Jones (2021), who indicated that disengaged students often require support in attention control and cognitive processing. WBT consistently aids with student attention and engagement. By implementing WBT systems, teachers can create an engaging and supportive learning environment that supports information

encoding while improving behavioral and academic outcomes (Hajovsky et al., 2023). Martella et al. (2020) discovered that students involved in active learning demonstrate a deeper comprehension of the subject matter and can more effectively apply their knowledge to new contexts. WBT is a teaching approach that actively engages all areas of the brain in a meaningful way during the learning process (Biffle, 2023)

The positive influence of WBT on teacher satisfaction and classroom dynamics can be linked to IPT's focus on the importance of sensory perceptions in learning. Chen and Liu (2022) found that cognitive teaching models, which emphasize understanding how the brain processes information, lead to improved attention and engagement. This study's participants reported similar benefits, noting that the fun and interactive nature of WBT helps create positive sensory experiences, which are vital for effective learning. This is consistent with Brown et al.'s (2014) claim that encoding sensory perceptions into meaningful representations in the brain is a fundamental aspect of learning. The alignment between the theoretical implications of IPT and the findings of this study highlights the importance of utilizing cognitive-based teaching strategies like WBT. These strategies enhance student learning by supporting the brain's natural information-processing capabilities.

Limitations and Delimitations

Limitations and delimitations were discovered. The limitations of this study include the sample size chosen and the need for a complete representation of the grade level K-12. The delimitation of this study included the specific location and teaching experience range.

Limitations

The study's limitations include the small sample size—only 11 participants were chosen. The small sample size is a limitation because it may misrepresent the diversity of a much larger

WBT group worldwide. Another limitation is that while participants represented various grade levels and had taught various grade levels, all teachers were within the K-5 range. There were no middle or high school teachers represented in this study.

Delimitations

This study's delimitation includes the purposeful recruitment of the participants only from the United States to reflect the classrooms in the United States. Participation in this study required a minimum of three years of teaching experience to ensure participants had experience in the classroom to reflect on their experiences. The participants also had to have a minimum of one year utilizing WBT systems. I decided to use teachers with previous experience with WBT to allow for a more well-developed research study.

Recommendations for Future Research

Few studies explore the lived experiences of teachers who utilize WBT. This study aimed to understand the experiences and perceptions of teachers who utilize WBT and to interpret and make sense of the experiences that shape their teaching practice. The proposed recommendations are provided to advance future research concerning this study. The limitations of this study present areas upon which to build. This study only recruited within the United States; further expansion of this study could expand beyond the United States.

Another recommendation would be to change the data collection methods to include teachers with less than three years of experience. This change may give insight into teachers just exiting college and how they perceive the WBT systems. A recommendation could also be only to gather sixth to 12th-grade participants. This could add to the research on WBT systems utilized with this student demographic. Another recommendation could be to conduct a quantitative study to analyze and compare WBT systems to traditional instruction or other

teaching methods. I would also recommend that future studies assess students before and after WBT strategies to add confirmability to the results.

A different qualitative method could be utilized to research the experiences of WBT teachers. A case study could analyze one teacher's experience with WBT in their classroom. This could provide rich details about teachers' perceptions and usage of the WBT system. A longitudinal study could be utilized by following a new WBT teacher over time, which could allow for the exploration of how WBT experience is gained through the online community and how to best prepare teachers for using WBT.

Conclusion

The problem this study noted was a need for teachers to provide student engagement in classrooms today and the ineffectiveness of teachers in cultivating a more profound learning experience. The purpose of this hermeneutic phenomenology study was to understand WBT through the experiences and perceptions of teachers who utilize this system in the United States. The theoretical framework underpinning this study was Miller's (1956) information processing theory. Participants were selected using purposeful criterion sampling to ensure they utilized the WBT systems. Data collection included individual interviews, journal prompts, and a focus group. The data was analyzed and separated into themes using van Manen's (2016) detailed reading approach. Data analysis revealed themes of transformation in teaching and classroom dynamics with WBT, influence on academics and behavior management with WBT strategies, and personal growth and professional fulfillment. This study implied that WBT systems added value to the classroom for teachers and students, increasing student learning and teacher satisfaction. Teachers' experiences suggested that WBT systems improved student behaviors and classroom dynamics. Future research was recommended based on the findings of this study.

References

Akar, H. (2020). The effect of smart board use on academic achievement: A meta-analytical and thematic study. *International Journal of Education in Mathematics, Science and Technology*, *8*(3), 261–273.

Alanazi, F. H. (2020). Brain-based learning as perceived by Saudi teachers and its effect on chemistry achievement of 7th graders. *Journal of Baltic Science Education*, *19*(6), 864–874.

Al-Mubireek, S. (2021). The effects of cooperative learning versus traditional teaching on students' achievement: A case study. *TESOL International Journal*, *16*(2), 31–55.

Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), The psychology of learning and motivation: Advances in research and theory (Vol. 2, pp. 89-195). *Academic Press*.

Aussems, S., & Kita, S. (2019). Seeing iconic gestures while encoding events facilitates children's memory of these events. *Child Development*, *90*(4), 1123–1137. http://dx.doi.org.ezproxy.liberty.edu/10.1111/cdev.12988

Bana, W., & Cranmore, J. (2019). Elementary teacher perceptions of professional development on the neuroscience of learning. *Mid-Western Educational Researcher*, *31*(3), 333–347.

Biffle, C. (2013). *Whole brain teaching for challenging kids: (and the rest of your class, too!).* Whole Brain Teaching, Inc.

Biffle, C. (2023). *Whole brain teaching for challenging kids (2nd edition).* Whole Brain Teaching, Inc.

Biffle, C. (2018). *Fast track: Seven steps to teaching heaven.* Whole Brain Teaching LLC.

Blackmer, S. (2018). Movement in the classroom. *TEACH Magazine*, May/June, 12-13. http://issuu.com/teachingmag/docs/teach_may/jun2018

Blinch, J., Harry, J. R., Hart, M. A., & Cousineau, D. (2022). Examining the mechanisms of internal and external focus of attention with Donders' subtractive method. *Motor Control*, *26*(3), 378–395. https://doi.org/10.1123/mc.2021-0100

Boardman, A. G., Boelé, A. L., & Klingner, J. K. (2018). Strategy instruction shifts teacher and student interactions during text-based discussions. *Reading Research Quarterly*, *53*(2), 175–195. http://dx.doi.org.ezproxy.liberty.edu/10.1002/rrq.191

Broadbent, H. J., Osborne, T., Rea, M., Peng, A., Mareschal, D., & Kirkham, N. Z. (2018). Incidental category learning and cognitive load in a multisensory environment across childhood. *Psychology*, *54*(6), 1020–1028. http://dx.doi.org.ezproxy.liberty.edu/10.1037/dev0000472

Brown, P. C, Roediger H.L., McDaniel, M.A. (2014). *Make it stick.* Belknap Press.

Bruijns, B. A., Adamo, K. B., Burke, S. M., Carson, V., Irwin, J. D., Naylor, P.-J., Timmons, B. W., Vanderloo, L. M., & Tucker, P. (2019). Exploring the physical activity and screenviewing-related knowledge, training, and self-efficacy of early childhood education candidates. *BMC Pediatrics, 19*(1), 5. https://doi.org/10.1186/s12887-018-1358-6

Bruner, J. S. (1966). *Towards a theory of instruction*. Cambridge: Harvard University Press.

Buchanan, R., Davis, L., & Cury, T. (2021). Putting research into "action": The impact of brain energizers on off-task behaviors and academic achievement. *Networks: An Online Journal for Teacher Research*, *23*(1).

Bunge, S. A., & Zelazo, P. D. (2006). A brain-based account of the development of rule use in childhood. *Current Directions in Psychological Science*, *15*(3), 118–121. **http://www.jstor.org/stable/20183092**

Carrazza, C., Wakefield, E. M., Hemani-Lopez, N., Plath, K., & Goldin-Meadow, S. (2021). Children integrate speech and gesture across a wider temporal window than speech and action when learning a math concept. *Grantee Submission*, *210*.

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum*, *41*(5), 545–547. https://doi.org/10.1188/14.ONF.545-547

Çeliköz, N., Erisen, Y., & Sahin, M. (2019). Cognitive learning theories with emphasis on latent learning, gestalt and information processing theories. *Online Submission*, *9*(3), 18–33.

Chang, C.-F., & Hall, N. C. (2022). Differentiating teachers' social goals: Implications for teacher-student relationships and perceived classroom engagement. *AERA Open*, *8*(1).

Chen, S., & Liu, J. (2022). The effects of cognitive constructivist teaching on students' attention and learning outcomes in a college English class. *Journal of Language Teaching and Research*, *13*(3), 745-755. https://doi.org/10.17507/jltr.1303.19

Clark, J., & Trofimovich, P. (2016). L2 vocabulary teaching with student- and teacher-generated gestures: A classroom perspective. *TESL Canada Journal*, *34*(1), 1–24.

Coch, D. (2018). Reflections on neuroscience in teacher education. *Peabody Journal of Education*, *93*(3), 309–319. https://doi.org/10.1080/0161956X.2018.1449925

Cole, K., Schroeder, K., Bataineh, M., & Al-Bataineh, A. (2021). Flexible seating impact on classroom environment. *Turkish Online Journal of Educational Technology - TOJET*, *20*(2), 62–74.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry & research design: Choosing among five approaches* (Fourth edition.). SAGE.

Dao, P., Nguyen, M. X. N. C., & Iwashita, N. (2021). Teachers' perceptions of learner engagement in L2 classroom task-based interaction. *Language Learning Journal*, *49*(6), 711–724.

Debes, S. R., & Dragoi, V. (2023). Suppressing feedback signals to visual cortex abolishes attentional modulation. *Science (New York, N.Y.)*, *379*(6631), 468–473. https://doi.org/10.1126/science.ade1855

DeLuca, C., Coombs, A., & LaPointe-McEwan, D. (2019). Assessment mindset: Exploring the relationship between teacher mindset and approaches to classroom assessment. *Studies in Educational Evaluation*, *61*, 159–169. https://doi.org/10.1016/j.stueduc.2019.03.012

Doyon, J., Penhune, V., & Ungerleider, L. G. (2003). Distinct contribution of the cortico-striatal and cortico-cerebellar systems to motor skill learning. *Neuropsychologia, 41*(3), 252-262.

Draganski, B., Gaser, C., Busch, V., Schuierer, G., Bogdahn, U., & May, A. (2004). Neuroplasticity: changes in grey matter induced by training. *Nature, 427*(6972), 311-312.

Dubinsky, J. M., Roehrig, G., & Varma, S. (2022). A place for neuroscience in teacher knowledge and education. *Mind, Brain & Education*, *16*(4), 267–276. https://doi.org/10.1111/mbe.12334

Duff, M., & Wohlstetter, P. (2019). Negotiating intergovernmental relations under ESSA. *Educational Researcher*, *48*(5), 296–308. https://doi.org/10.3102/0013189X19854365

Elfiky, D. E. G. (2022). The effect of a whole brain teaching based instruction on developing number competencies and arithmetic fluency in kindergarten children. *International Journal of Instruction*, *15*(1), 673–684.

Emyus, A. Z., Degeng, I. N. S., Setyosari, P., & Ulfa, S. (2020). The influence of whole brain teaching (WBT) to the motoric and linguistic skills of preschoolers. *International Journal of Instruction*, *13*(4), 799–814.

Ferrante, O., Zhigalov, A., Hickey, C., & Jensen, O. (2023). Statistical learning of distractor suppression downregulates prestimulus neural excitability in early visual cortex. *The Journal of Neuroscience : The Official Journal of the Society for Neuroscience*, *43*(12), 2190–2198. https://doi.org/10.1523/JNEUROSCI.1703-22.2022

Forster, E. M. & Armstrong, P. B. (1998). *Howards end: Authoritative text, textual appendix, backgrounds and contexts, criticism* (First edition.). W.W. Norton.

Foster, M. I., & Keane, M. T. (2019). The role of surprise in learning: Different surprising outcomes affect memorability differentially. *Topics in Cognitive Science*, *11*(1), 75–87. https://doi.org/10.1111/tops.12392

Friedman, I. A., Grobgeld, E., & Teichman-Weinberg, A. (2019). Imbuing education with brain research can improve teaching and enhance productive learning. *Psychology, 10,* 122-131. https://doi.org/10.4236/psych.2019.102010

Frondozo, C. E., King, R. B., Nalipay, M. J. N., & Mordeno, I. G. (2020). Mindsets matter for teachers, too: Growth mindset about teaching ability predicts teachers' enjoyment and engagement. *Current Psychology*. https://doi.org/10.1007/s12144-020-01008-4

Gan, Z., Liu, F., & Nang, H. (2023). The role of self-efficacy, task value, and intrinsic and extrinsic motivations in students' feedback engagement in English learning. *Behavioral Sciences (2076-328X)*, *13*(5), 428. https://doi.org/10.3390/bs13050428

Gao, X., & Zhang, L. (2021). Information processing theory-based cognitive and motivational strategies for promoting students' learning in mathematics. *Journal of Education and Learning, 10*(2), 246-256. https://doi.org/10.5539/jel.v10n2p246

Gazzaniga, M. S., Ivry, R. B., & Mangun, G. R. (2012). *Cognitive neuroscience: The biology of the mind*. WW Norton & Company.

Gholami, K., Alikhani, M., & Tirri, K. (2022). Empirical model of teachers' neuroplasticity knowledge, mindset, and epistemological belief system. *Frontiers in Psychology*, *13*, 1042891. https://doi.org/10.3389/fpsyg.2022.1042891

Goswami, U. (2006). Neuroscience and education: From research to practice? *Nature Reviews Neuroscience, 7*(5), 406–413. https://doi.org/10.1038/nrn1907

Grant, C., & Osanloo, A. (2014). Understanding, selecting, and integrating a theoretical framework in dissertation research: creating the blueprint for your "house." *Administrative Issues Journal: Connecting Education, Practice, and Research, 4*(2), 12–26.

Granziera, H., & Perera, H. N. (2019). Relations among teachers' self-efficacy beliefs, engagement, and work satisfaction: A social cognitive view. *Contemporary Educational Psychology, 58*, 75–84. https://doi.org/10.1016/j.cedpsych.2019.02.003

Greipl, S., Klein, E., Lindstedt, A., Kiili, K., Moeller, K., Karnath, H.-O., Bahnmueller, J., Bloechle, J., & Ninaus, M. (2021). When the brain comes into play: Neurofunctional

correlates of emotions and reward in game-based learning. *Computers in Human Behavior*, *125*, N.PAG. https://doi.org/10.1016/j.chb.2021.106946

Gülpinar, M. A., Isoglu-Alkaç, Ü., & Yegen, B. Ç. (2015). Integrated and contextual basic science instruction in preclinical education: Problem-based learning experience enriched with brain/mind learning principles. *Educational Sciences: Theory and Practice*, *15*(5), 1215–1228.

Gutshall, C. A. (2020). When teachers become students: Impacts of neuroscience learning on elementary teachers' mindset beliefs, approach to learning, teaching efficacy, and grit. *European Journal of Psychology and Educational Research*, *3*(1), 39–48.

Hall, G. E., & DiPerna, J. C. (2017). Childhood social skills as predictors of middle school academic adjustment. *Journal of Early Adolescence*, *37*(6), 825–851. http://dx.doi.org.ezproxy.liberty.edu/10.1177/0272431615624566

Hajovsky, D B., Chesnut, S. R., Helbig, K. A., & Goranowski, S. M. (2023). On the examination of longitudinal trends between teacher-student relationship quality and social skills during elementary school. *School Psychology Review,* 52(6), 679-695. https://doi.org/10.1080/2372966X.2021.1883995

Holy Bible King James Version. (2016). Christian Art Publishers. (Original work published 1930).

Howard-Jones, P. A. (2014). Neuroscience and education: myths and messages. *Nature Reviews Neuroscience*, *15*(12), 817-824.

Huff, T., Mahabadi, N., & Tadi, P. (2022). *Neuroanatomy, Visual Cortex*.

Hughes, B., Sullivan, K. A., & Gilmore, L. (2022). Neuromyths about learning: Future directions from a critical review of a decade of research in school education. *Prospects (00331538)*, *52*(1/2), 189–207. https://doi.org/10.1007/s11125-021-09567-5

Hunt, A.-B., & Holmes, K. P. (2018). Innovative sets and closures: Evidence-based ways to engage students. *Kappa Delta Pi Record*, *54*(3), 116–121. http://dx.doi.org.ezproxy.liberty.edu/10.1080/00228958.2018.1481649

Jensen, E. (2000). Brain-based learning: A reality check. *Educational Leadership*, *57*(7), 76–80.

Jensen, E. (2005). *Teaching with the brain in mind, 2nd Edition.* Association for Supervision and Curriculum Development.

Jensen, E. & McConchie, L. (2020). *Brain-based learning: Teaching the way students really learn.* Corwin.

Jansen, K., & Kiefer, S. M. (2020). Understanding brain development: Investing in young adolescents' cognitive and social-emotional development. *Middle School Journal*, *51*(4), 18–25. http://dx.doi.org.ezproxy.liberty.edu/10.1080/00940771.2020.1787749

Jung-Beeman, M. (2005). Bilateral brain processes for comprehending natural language. *Trends in Cognitive Sciences, 9*(11), 512-518.

Kaya, S., & Yuksel, D. (2022). Teacher mindset and grit: How do they change by teacher training, gender, and subject taught? *Participatory Educational Research*, *9*(6), 418–435.

Lalancette, H., & Campbell, S. R. (2012). Educational neuroscience: Neuroethical considerations. *International Journal of Environmental and Science Education*, *7*(1), 37–52.

LaVarco, A., Ahmad, N., Archer, Q., Pardillo, M., Nunez Castaneda, R., Minervini, A., & Keenan, J. P. (2022). Self-conscious emotions and the right fronto-temporal and right

temporal parietal junction. *Brain Sciences (2076-3425)*, *12*(2), 138. https://doi.org/10.3390/brainsci12020138

Lems, K. (2018). New ideas for teaching English using songs and music. *English Teaching Forum, 56*(1), 14–21.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.

Logan, G. (2000). Information-processing theories. In Encyclopedia of psychology, Vol. 4. (pp. 294–297). *American Psychological Association*. https://doi.org/10.1037/10519-118

Martella, A. M., Klahr, D., & Li, W. (2020). The relative effectiveness of different active learning implementations in teaching elementary school students how to design simple experiments. *Journal of Educational Psychology*, *112*(8), 1582–1596.

McCall, L. A. H. (2018). Teaching the way the brain is: Working successfully in an urban classroom with children who live in poverty. *National Youth-At-Risk Journal, 3*(1), 38–48.

McTighe, J., & Willis, J. (2019). *Upgrade your teaching: Understanding by design meets neuroscience*. ASCD.

Medina, J. (2008). *Brain rules: 12 principles for surviving and thriving at work, home, and school*. Pear Press.

Michael, R. D., Webster, C. A., Egan, C. A., Nilges, L., Brian, A., Johnson, R., & Carson, R. L. (2019). Facilitators and barriers to movement integration in elementary classrooms: A systematic review. *Research Quarterly for Exercise & Sport*, *90*(2), 151–162.

Miller. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review.*, *63*(2), 81–97. https://doi.org/10.1037/h0043158

Moon, J., Webster, C. A., Herring, J., & Egan, C. A. (2022). Relationships between Systematically Observed Movement Integration and Classroom Management in Elementary Schools. *Journal of Positive Behavior Interventions*, *24*(2), 122–132.

Moses, D. A., Leonard, M. K., Chang, E. F., & Chang, C. (2019). Real-time decoding of question-and-answer speech dialogue using human cortical activity. *Nature Communications, 10*(1), 3096.

Moustakas, C. E. (1994). *Phenomenological research methods*. Sage Publications.

Nalipay, M. J. N., King, R. B., Mordeno, I. G., Chai, C.-S., & Jong, M. S. (2021). Teachers with a growth mindset are motivated and engaged: the relationships among mindsets, motivation, and engagement in teaching. *Social Psychology of Education*, *24*(6), 1663–1684. https://doi.org/10.1007/s11218-021-09661-8

National Research Council. (2000). *How people learn*. National Academies Press. https://doi.org/10.17226/9853

Odak, I., Marušić, I., Bojić, J. M., Puzić, S., Bakić, H., Eliasson, N., Klicpera, B. G., Gøtzsche, K., Kozina, A., Perković, I., Roczen, N., Tomé, G., & Veldin, M. (2023). Teachers' social and emotional competencies: A lever for social and emotional learning in schools. *Sociology & Space / Sociologija i Prostor*, *61*(1), 105–122. https://doi.org/10.5673/sip.61.1.5

Overoye, A. L., & Storm, B. C. (2019). Remembering what was said and done: The activation and facilitation of memory for gesture as a consequence of retrieval. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 45*(3), 526–534. http://dx.doi.org.ezproxy.liberty.edu/10.1037/xlm0000591

Patton, M. (2015). *Qualitative research and evaluation methods* (4th ed.). Sage.

Perikova, E. I., Blinova, E. N., Andriushchenko, E. A., Blagovechtchenski, E. D., Shcherbakova, O. V., & Shtyrov, Y. Y. (2023). The specific influence of continuous theta-burst stimulation of the primary motor cortex on novel vocabulary acquisition in different learning environments. *Human Physiology*, *49*(3), 289–297

Piaget, J. (1952). *The origins of intelligence in children*. New York, NY: International University Press, Inc.

Piaget, J. (1972). *The psychology of intelligence*. Routledge & Kegan Paul.

Priyadarshini, M., Anna, P., Yang, R., & Lee, B. (2019). Engaging early childhood learners: Effectiveness of whole brain teaching in mathematics classroom'. *IOSR Journal of Humanities and Social Science (IOSR-JHSS), 24*(3), 105.

Qureshi, M. A., Khaskheli, A., Qureshi, J. A., Raza, S. A., & Yousufi, S. Q. (2021). Factors affecting students' learning performance through collaborative learning and engagement. *Interactive Learning Environments*, 1–21. https://doi.org/10.1080/10494820.2021.1884886

Rademaker, R. L., Chunharas, C. & Serences, J.T. (2019). Coexisting representations of sensory and mnemonic information in human visual cortex. *Nat Neurosci 22*, 1336–1344. https://doi.org/10.1038/s41593-019-0428-x

Rahman, M. M. (2019). 21st century skills "Problem Solving": Defining the concept. *Online Submission*, *2*(1), 71-81.

Rasmitadila, R., Widyasari, W., Prasetyo, T., Rachmadtullah, R., Samsudin, A., & Aliyyah, R. R. (2021). General teachers' experience of the brain's natural learning systems-based

instructional approach in inclusive classroom. *International Journal of Instruction*, *14*(3), 95–116.

Rivera-Urbina, G. N., Mendez Joya, M. F., Nitsche, M. A., & Molero-Chamizo, A. (2019). Anodal tDCS over Wernicke's area improves verbal memory and prevents the interference effect during words learning. *Neuropsychology*, *33*(2), 263–274. https://doi.org/10.1037/neu0000514

Rolf, K. R., & Slocum, T. A. (2021). Features of direct instruction: Interactive lessons. *Behavior Analysis in Practice*, *14*(3), 793–801. https://doi.org/10.1007/s40617-021-00613-4

Salem, A. A. M. S. (2017). Engaging ESP students with brain-based learning for improved listening skills, vocabulary retention and motivation. *English Language Teaching, 10*(12), 182–195.

Sarker, P. C., Siddique, M. N.-E.-A., Sultana, S., & Pal, S. K. (2023). Comparison between traditional classroom and flipped classroom on student's engagement and satisfaction. *International Journal of Multidisciplinary (Online)*, *4*(2), 624–635. https://doi.org/10.11594/ijmaber.04.02.29

Schlinger, H. D. (2021). The impact of B. F. Skinner's science of operant learning on early childhood research, theory, treatment, and care. *Early Child Development and Care*, *191*(7–8), 1089–1106.

Schunk, D. H. (2020). *Learning theories: An educational perspective*. Pearson.

Schwandt, T. A., Lincoln, Y. S., & Guba, E. G. (2007). Judging interpretations: But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Evaluation : A Publication of the American Evaluation Association.*, *2007*(114), 11–25. https://doi.org/10.1002/ev.223

Scott, C. M., & Myers, B. M. (2021). Montessori education: Teacher perceptions of challenges in transitioning to virtual instruction. *Journal of Montessori Research*, *7*(2), 1–11.

Sharini, H., Zolghadriha, S., Riyahi Alam, N., Jalalvandi, M., Khabiri, H., Arabalibeik, H., & Nadimi, M. (2021). Assessment of motor cortex in active, passive and imagery wrist movement using functional MRI. *Journal of Biomedical Physics & Engineering*, *11*(4), 515–526. https://doi.org/10.31661/jbpe.v0i0.1034

Smith, A., & Jones, B. (2021). The effects of video game distraction on classroom learning. *Journal of Educational Psychology*, *113*(2), 302-313. https://doi.org/10.1037/edu0000427

Sousa, D. A. (2021). Neuroscience research: Support for social-emotional and cognitive learning. *Kappa Delta Pi Record*, *57*(1), 6–10. http://dx.doi.org.ezproxy.liberty.edu/10.1080/00228958.2021.1851580

Tatar, O. İ., Kuru, A., & Konuk, M. (2022). Did you know that epigenetic reflections in synaptic plasticity have a function in memory and learning? *Anatomy: International Journal of Experimental & Clinical Anatomy*, *16,* 286–287. https://doi.org/10.2399/ana.22.003s

Tavsanli, O. F., Kaldirim, A., & Gedikli, T. E. (2021). Enhancing permanence for vocabulary learning on 2nd grade students in Turkey through music. *GIST Education and Learning Research Journal*, *22*, 51–73.

Tham, R., Walker, Z., Tan, S. H. D., Low, L. T., & Annabel Chen, S.-H. (2019). Translating education neuroscience for teachers. *Learning: Research & Practice*, *5*(2), 149–173. https://doi.org/10.1080/23735082.2019.1674909

Thomas, M. S. C., Ansari, D., & Knowland, V. C. P. (2019). Annual Research Review: Educational neuroscience: progress and prospects. *Journal of Child Psychology & Psychiatry*, *60*(4), 477–492. https://doi.org/10.1111/jcpp.12973

Tian, X., Zhao, J., & Nguyen, K. T. (2022). Practical research on primary mathematics teaching based on deep learning. *Scientific Programming*, 1–7. https://doi.org/10.1155/2022/7899180

Torgyik, J. (2022). Some aspects of the children-friendly school with holistic approach. *Journal of Educational Sciences / Revista de Stiintele Educatiei*, *23*(1), 113–123. https://doi.org/10.35923/JES.2022.1.08

Tsai, M.-J., & Tsai, C.-C. (2003). Information searching strategies in web-based science learning: The role of internet self-efficacy. *Innovations in Education and Teaching International*, *40*(1), 43–50

Tsang, T. W., & Lu, H. J. (2022). Hand movement improves word memory of grade 1 students. *International Journal of School & Educational Psychology*, *10*(3), 408–417.

Ütkür Güllühan, N., Özden, G., & Bekiroglu, D. (2022). Museum education with storyline method: How do primary school students perceive historical artifacts? *Elementary School Forum (Mimbar Sekolah Dasar)*, *9*(1), 98–124.

Van Atteveldt, N., Tijsma, G., Janssen, T., & Kupper, F. (2019). Responsible research and innovation as a novel approach to guide educational impact of mind, brain, and education research. *Mind, Brain, and Education, 13*(4), 279-287. https://doiorg.ezproxy.liberty.edu/10.1111/mbe.12213

Van Dijk, W., & Lane, H. B. (2020). The brain and the US education system: Perpetuation of neuromyths. *Exceptionality*, *28*(1), 16–29. https://doi.org/10.1080/09362835.2018.1480954

Van Leeuwen, A., & Janssen, J. (2019). A systematic review of teacher guidance during collaborative learning in primary and secondary education. *Educational Research Review*, *27*, 71–89. https://doi.org/10.1016/j.edurev.2019.02.001

Van Manen. (1990). Researching lived experience: Human science for an action sensitive pedagogy. *State University of New York Press*.

Van Manen. (2014). Phenomenology of practice: meaning-giving methods in phenomenological research and writing. *Left Coast Press*.

Venketsamy, R., Sing, N., & Smart, L. (2020). Teachers' perceptions in creating an invitational learning environment in culturally diverse foundation phase classrooms. *Perspectives in Education*, *38*(2), 118–137. https://doi.org/10.18820/2519593X/pie.v38.i2.08

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wagh, N. (2021). Innovating for children's well-being and global citizenship. *Childhood Education*, *97*(3), 44–47.

Wammes, J. D., Ralph, B. C. W., Mills, C., Bosch, N., Duncan, T. L., & Smilek, D. (2019). Disengagement during lectures: Media multitasking and mind wandering in university classrooms. *Computers & Education*, *132*, 76–89. https://doi.org/10.1016/j.compedu.2018.12.007

Wardell, V., Madan, C. R., Jameson, T. J., Cocquyt, C. M., Checknita, K., Liu, H., & Palombo, D. J. (2021). How emotion influences the details recalled in autobiographical memory. *Applied Cognitive Psychology, 35*(6), 1454–1465.

Watagodakumbura, C. (2017). Principles of curriculum design and construction based on the concepts of educational neuroscience. *Journal of Education and Learning, 6*(3), 54–69.

Werner, R. (2018). Music, movement and memory: Pedagogical songs as mnemonic Aids. *TESOL Journal*, *9*(4). http://dx.doi.org.ezproxy.liberty.edu/10.1002/tesj.387

Whitescarver, K., & Cossentino, J. (2008). Montessori and the mainstream: A century of reform on the margins. *Teachers College Record*, *110*(12), 2571–2600.

Wolfe, P., & Nevills, P. (2004). *Brain matters: Translating research into classroom practice.* Association for Supervision and Curriculum Development.

Wu, Y., Liu, J., Yu, G., Jv, R., Wang, Y., & Zang, P. (2022). Association fiber tracts related to Broca's area: A comparative study based on diffusion spectrum imaging and fiber dissection. *Frontiers in Neuroscience*, *16*, 978912. https://doi.org/10.3389/fnins.2022.978912

Yaghmour, K. S., & Obaidat, L. T. (2022). The effectiveness of using direct instruction in teaching comprehension skill of third-grade students. *International Journal of Instruction*, *15*(2), 373–392. https://doi.org/10.29333/iji.2022.15221a

Zhang, L. (2022). Guidance differs between teaching modes: practical challenges in integrating hands-on investigations with direct instruction. *Learning: Research & Practice*, *8*(2), 96–115. https://doi.org/10.1080/23735082.2022.2105937

Appendix A

IRB Approval

[redacted]

Thu 3/21/2024 11:29 AM

[EXTERNAL EMAIL: Do not click any links or open attachments unless you know the sender and trust the content.]

LIBERTY UNIVERSITY
INSTITUTIONAL REVIEW BOARD

March 21, 2024

Tiffany Jay-Claycomb
Mary Strickland

Re: IRB Exemption - IRB-FY23-24-1373 Exploring Teachers' Perception and Use of Whole Brain Teaching: A Hermeneutic Phenomenological Study

Dear Tiffany Jay-Claycomb, Mary Strickland,

The Liberty University Institutional Review Board (IRB) has reviewed your application per the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data-safeguarding methods described in your IRB application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:104(d):

Category 2.(ii). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by §46.111(a)(7).

For a PDF of your exemption letter, click on your study number in the My Studies card on your Cayuse dashboard. Next, click the Submissions bar beside the Study Details bar on the Study Details page. Finally, click Initial under Submission Type and choose the Letters tab toward the bottom of the Submission Details page. Your information sheet and final versions of your study documents, **which you must use to conduct your study,** can also be found on the same page under the Attachments tab.

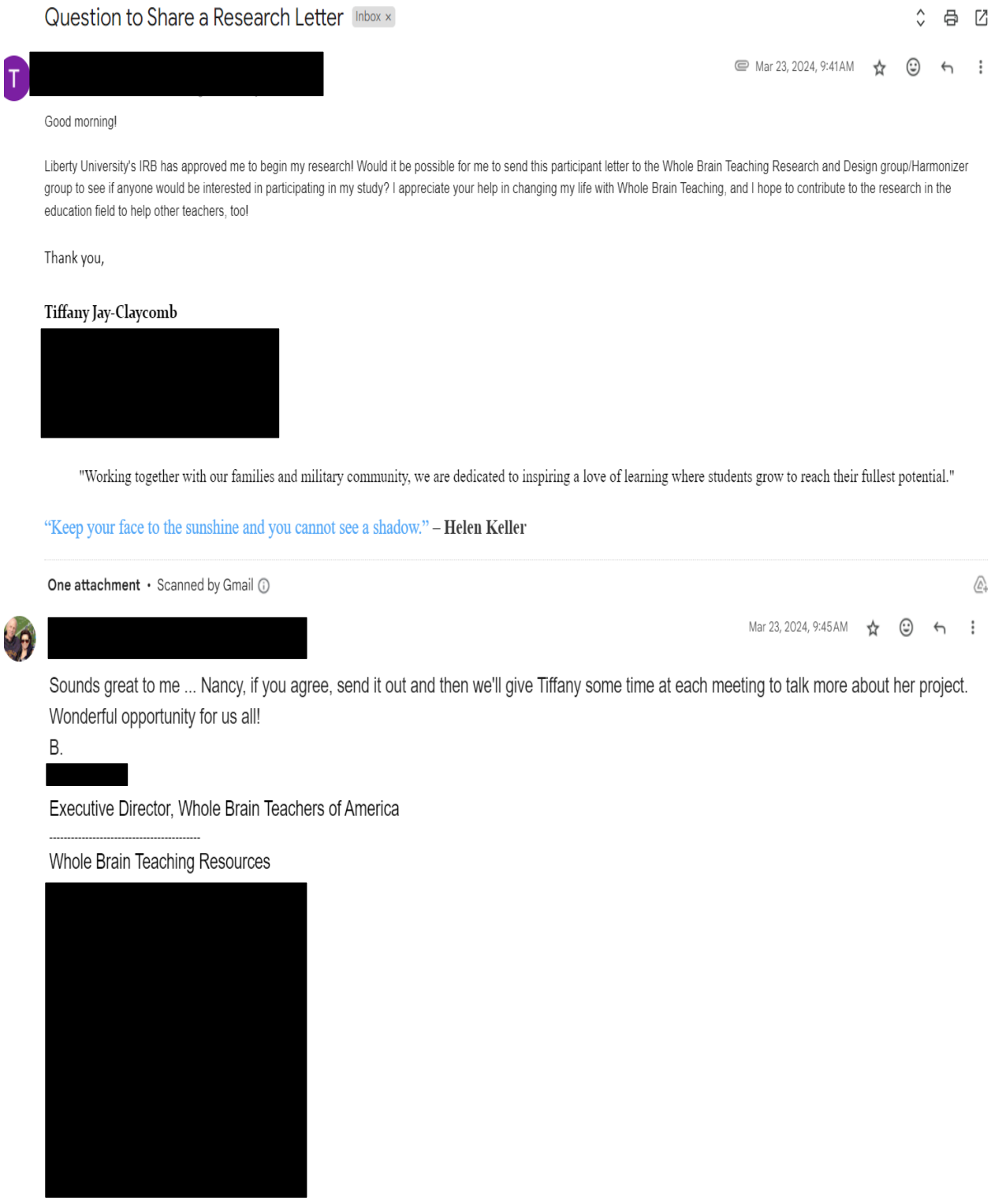
This exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,
G. Michele Baker, PhD, CIP
Administrative Chair
Research Ethics Office

Appendix B

Site Permission



Question to Share a Research Letter Inbox ×

[redacted] Mar 23, 2024, 9:41AM

Good morning!

Liberty University's IRB has approved me to begin my research! Would it be possible for me to send this participant letter to the Whole Brain Teaching Research and Design group/Harmonizer group to see if anyone would be interested in participating in my study? I appreciate your help in changing my life with Whole Brain Teaching, and I hope to contribute to the research in the education field to help other teachers, too!

Thank you,

Tiffany Jay-Claycomb

[redacted]

"Working together with our families and military community, we are dedicated to inspiring a love of learning where students grow to reach their fullest potential."

"Keep your face to the sunshine and you cannot see a shadow." – Helen Keller

One attachment • Scanned by Gmail

[redacted] Mar 23, 2024, 9:45AM

Sounds great to me ... Nancy, if you agree, send it out and then we'll give Tiffany some time at each meeting to talk more about her project. Wonderful opportunity for us all!

B.

[redacted]

Executive Director, Whole Brain Teachers of America

Whole Brain Teaching Resources

[redacted]

Appendix C

Recruitment Letter

Dear Potential Participant,

As a doctoral candidate in the School of Education at Liberty University, I am conducting research to better understand teachers' perceptions and use of Whole Brain Teaching as part of the requirements for a doctor of philosophy degree. The purpose of my research is to understand the experiences and perceptions of teachers who utilize Whole Brain Teaching and to interpret and make sense of the experiences that shape their teaching practice. I am writing to invite you to join my study.

Participants must be K-12 teachers who have taught for at least three years and have been utilizing Whole Brain Teaching for at least one year. Participants will be asked to take part in a virtual one-on-one, audio- and video-recorded Zoom interview, complete written journal prompt questions through email, and take part in a virtual, audio- and video-recorded Zoom focus group. It should take approximately forty-five minutes to an hour to complete the individual interview as well as forty-five minutes to an hour to complete the focus group interview. Journal prompts of 200-400 words will be collected after three days through email. Names and other identifying information will be requested as part of the study, but participant identities will not be disclosed.

To participate, please click here: [redacted] If you meet my participant criteria, I will contact you to schedule an interview.

A consent document will be emailed to you if you meet the study criteria. The consent document contains additional information about my research. If you choose to participate, you will need to sign and return the consent form to me via email prior to the interview.

Thank you for considering my request.

Sincerely,

Tiffany Jay-Claycomb
Doctoral Candidate, Liberty University

Appendix D

Demographic Survey for Potential Participants

1. What grade are you teaching now?

    - Kindergarten – 5th
    - 6th – 8th
    - 9th – 12th
    - Other

2. How long have you been a teacher?

    - 0 – 2 years
    - 3 – 5 years
    - 6 or more years

3. Have you utilized Whole Brain Teaching in your classroom for at least one year?

    - Yes
    - No

4. Please type your name, state, email, and phone number.

    - Name
    - State/Province
    - Email Address
    - Phone Number

Appendix E

Follow up Email

I appreciate your interest in my research! I have attached a consent form. Please sign and date (your typed signature works), then return to this email. [redacted]

When you return the consent form, please list at least three dates and times you would be available for a one-on-one Zoom interview lasting up to 45 minutes. Once you have returned the consent form and available dates, I will send you a Zoom link for your chosen date. In advance, I would like to thank you for your help with this research.

I look forward to speaking with you! Thank you,

Tiffany Jay-Claycomb
Doctoral Candidate, Liberty University
[redacted]

Appendix F

Consent

Title of the Project: Exploring Teachers' Perception and Use of Whole Brain Teaching: A Hermeneutic Phenomenological Study
Principal Investigator: Tiffany Jay-Claycomb, Doctoral Candidate, School of Education, Liberty University

Invitation to be Part of a Research Study

You are invited to participate in a research study. To participate, you must be a K-12 teacher, have been a teacher for at least 3 years, and have utilized Whole Brain Teaching for at least 1 year. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to take part in this research.

What is the study about and why is it being done?

The purpose of the study is to understand the experiences and perceptions of teachers who utilize Whole Brain Teaching and to interpret and make sense of the experiences that shape their teaching practice.

What will happen if you take part in this study?

If you agree to be in this study, I will ask you to do the following:

1. Take part in a virtual, one-on-one, audio- and video-recorded Zoom interview. It should take approximately forty-five minutes to an hour to complete.
2. Complete journal prompts of 200-400 words that will be collected after three days through email.
3. Take part in a virtual, audio- and video-recorded Zoom focus group. It should take approximately forty-five minutes to an hour to complete.

How could you or others benefit from this study?

Participants should not expect to receive a direct benefit from taking part in this study.

Benefits to society include adding to the literature on teachers' perception and use of Whole Brain Teaching.

What risks might you experience from being in this study?

The expected risks from participating in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

How will personal information be protected?

The records of this study will be kept private. Published reports will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses will be kept confidential by replacing names with pseudonyms.
- Interviews will be conducted in a location where others will not easily overhear the conversation.
- Confidentiality cannot be guaranteed in focus group settings. While discouraged, other members of the focus group may share what was discussed with persons outside of the group.
- Data will be stored on a password-locked computer. After seven years, all electronic records will be deleted.
- Recordings will be stored on a password-locked computer for seven years and then deleted. The researcher will have access to the recordings.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

What should you do if you decide to withdraw from the study?

If you choose to withdraw from the study, please contact the researcher at the email address/phone number included in the next paragraph. Should you choose to withdraw, data collected from you, apart from focus group data, will be destroyed immediately and will not be included in this study. Focus group data will not be destroyed, but your contributions to the focus group will not be included in the study if you choose to withdraw.

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study is Tiffany Jay-Claycomb. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at [redacted]. You may also contact the researcher's faculty sponsor, Dr. [redacted], at [redacted].

Whom do you contact if you have questions about your rights as a research participant?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the IRB. Our physical address is Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA, 24515; our phone number is 434-592-5530, and our email address is irb@liberty.edu.

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Consent

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will be given a copy of this document for your records. The researcher will keep a copy with the study records. If you have any questions about the study

after you sign this document, you can contact the study team using the information provided above.

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

☐ The researcher has my permission to audio-record and video-record me as part of my participation in this study.

_____
Printed Subject Name

_____
Signature & Date

Appendix G

Individual Interview Questions

Table 1

Individual Interview Questions

2. Please explain your journey of becoming a teacher. When did you know you wanted to be a teacher?
3. How did you first become familiar with Whole Brain Teaching? CRQ
4. What led you to try Whole Brain Teaching in your classroom? CRQ
5. How have you implemented Whole Brain Teaching in your classroom? CRQ
6. How have your students responded to Whole Brain Teaching? SQ1
7. How has Whole Brain Teaching changed your teaching practice? SQ2
8. Can you give an example of how Whole Brain Teaching has impacted a specific lesson or activity in your classroom? SQ2
9. How has Whole Brain Teaching impacted student engagement and motivation in your classroom? SQ1
10. Have you noticed any changes in student behavior or academic performance since implementing Whole Brain Teaching? SQ1
11. How have you collaborated with other teachers or administrators to support the implementation of Whole Brain Teaching? SQ2
12. How have you adapted Whole Brain Teaching to meet the unique needs and abilities of your students? SQ1
13. Have you received any professional development or support in using Whole Brain Teaching? SQ2

14. How have you incorporated Whole Brain Teaching into lesson planning and preparation? SQ2
15. Have you noticed changes in your stress or workload due to using Whole Brain Teaching? CRQ
16. Have you, and if so, how have you involved parents and families in incorporating Whole Brain Teaching in your classroom? CRQ
17. Have you noticed any changes in student learning when comparing Whole Brain Teaching to other teaching methods you have used? CRQ
18. How do you see Whole Brain Teaching merging into the culture and goals of your school? CRQ
19. How have you integrated student feedback into your use of Whole Brain Teaching? SQ2
20. Have you noticed challenges in using Whole Brain Teaching, and how have you overcome those challenges? CRQ
21. How have you grown in understanding and using Whole Brain Teaching since you started using it? CRQ
22. What advice would you give other teachers interested in using Whole Brain Teaching in their classrooms? CRQ

Appendix H

Journal Prompts

Table 2

Journal Prompt Questions

1. Please reflect on your experiences with Whole Brain Teaching. What meanings and perspectives have you attached to these experiences? (Feelings, effectiveness, emotions, etc.) How have these ideas shaped your perception of the effectiveness of utilizing WBT in your classroom? CRQ
2. Please explain if your usage of WBT strategies has allowed you to learn about how your students' brains learn best. How do you see a difference in your student's engagement with you and the lessons you are teaching in comparison to your teaching before you started utilizing WBT strategies? SQ3

Appendix I

Focus Group Questions

Table 3

Focus Group Questions

1. What are your favorite parts of Whole Brain Teaching in your classroom and why? CRQ
2. Please explain if you use some aspects of Whole Brain Teaching instead of others and why. CRQ
3. What have been some of the most successful aspects of Whole Brain Teaching in your classroom that you use now but did not use when you first started using Whole Brain Teaching? CRQ
4. How have your students responded to Whole Brain Teaching? SQ2
5. Why would some students not participate in Whole Brain Teaching games? SQ2
6. How have you addressed students who do not buy into Whole Brain Teaching? SQ2
7. How has Whole Brain Teaching changed your teaching practice? SQ1
8. How has Whole Brain Teaching aided you in elevating and evolving your view of student learning? SQ2
9. How has the delivery of your lessons changed? SQ1
10. How would you explain Whole Brain Teaching to a novice teacher? CRQ
11. What misconceptions have students, teachers, or families expressed about Whole Brain Teaching? SQ1
12. How do you see Whole Brain Teaching impacting education in the future? CRQ

Appendix J

Teacher Participants

Table 4

Teacher Participants

Teacher Participant	Years Taught	WBT Certification Level	Grade Level
Mary	10+	Platinum	K-5
Liz	3-5	Silver	K-5
Jane	10+	Platinum	K-5
Matthew	10+	Platinum	K-5
Bailey	10+	Platinum	K-5
Joy	10+	Platinum	K-5
Melissa	10+	Platinum	K-5
Lena	10+	Silver	K-5
Tara	10+	Gold	K-5
Gale	10+	Silver	K-5
Kelsey	10+	Silver	K-5

Appendix K

Themes and Subthemes

Table 5

Themes & Subthemes

Theme	Subthemes		
Transformation in Teaching and Classroom Dynamics with WBT	Teaching Joy	Influence on Classroom Environment	Connections
Influence on Academics and Behavior Management with WBT Strategies	Brain-Based Learning	Strategies for Student Engagement	Growth and Improvement
Personal Growth and Professional Fulfillment	Rejuvenation	Integration and Evolution	Professional Environment and Resources