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Teacher Beliefs and the Intent and Current Use of Movement as it Influences Students With and Without ADHD

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TEACHER BELIEFS AND THE INTENT AND CURRENT USE OF MOVEMENT AS IT INFLUENCES STUDENTS WITH AND WITHOUT ADHD

by

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ABSTRACT

The purpose of this study was to add to the knowledge base regarding utilizing movement in the classroom as it influences reading and mathematics achievement for students with and without Attention-Deficit Hyperactivity Disorder. Mississippi public school teachers (n= 379) responded to an online questionnaire that gathered demographic data and collected ratings based on teacher beliefs and both their current use of movement and intent to use movement in the classroom based on a 5-point Likert scale.

In order to predict if a relationship existed between teacher beliefs of utilizing movement in the classroom and both their current use of movement and intent to use it in the classroom to increase student achievement in mathematics and reading, a multiple linear regression was used. The regression model revealed a positive, statistically significant predictor of teacher current use of movement with the beliefs that movement does indeed increase academic achievement in students with and without ADHD. A significant association was identified between the perceived teacher beliefs and the grade level the teacher is currently teaching. As the variable, grade level increased, the current use of movement decreased. The weekly personal activity level of respondents also had a statistically significant association with the perceived teacher beliefs. As this variable increased one unit, the teachers' belief in using movement decreased.

All students, especially those with ADHD, need exercise helping with concentration and providing an outlet for proper impulse discharge, helping to control impulsivity (Mulrine, Prater, & Jenkins, 2008). Movement helps reduce problematic classroom behavior and better focus students' attention on instruction. Mulrine et al. (2008) found that exercise helps students cope more effectively with stress, promotes a

positive self-image, and improves thought patterns. Because teachers chose teaching strategies they deliver in the classroom, it is essential to begin to understand whether they use and believe movement in the classroom is useful.

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DEDICATION

This dissertation is dedicated to several people in my family. First, I would like to thank both of my parents. I only made it to this point with their love and support. They instilled a love for learning early in my life and taught me how important a good education is.

I dedicate this dissertation to both of my children, Kaleigh and Abigail. May you both always know just how loved you are!! They have remained by my side throughout this process and allowed me to lean on them for support and encouragement.

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CHAPTER I

INTRODUCTION

Traditionally, educators have assumed that sitting still is an essential element of attention (Carson, Shih, & Langer, 2001). Movement in the classroom and varying students' perspectives have been viewed as elements that might hinder student attention. Educators are often uncomfortable with integrating movement within the classroom. Many teachers believe that the necessary elements of paying attention are being able to sit still and constancy (Carson, Shih, & Langer, 2001). This assumption goes against what cognitive researchers have learned about attention.

Attention is drawn to and held by novelty rather than stillness and constancy in the environment (Carson et al., 2001). The perception of novelty both increases the attention level and activates the ability to think and remember. Carson and colleagues' (2001) research highlight the tendency of students to tune out when they perceive the environment as lacking novelty. One way to increase innovation is to vary the modality of learning for the observer and increase movement. Students studying in a traditional classroom who are allowed to move around and interact with the learning materials may be able to remember and learn the material more easily than students who view the materials while seated at their desk (Carson et al., 2001).

Many teachers remain focused on verbal/linguistic and logical/mathematical intelligence and cater to the auditory and visual learners while utilizing inadequate methods to teach many children (Skoning, 2008). Students with Attention Deficit Hyperactivity Disorder (ADHD) often do not have strengths in verbal/linguistic or

logical/mathematical areas. They are usually identified because of their difficulty with linguistic and mathematical tasks.

Interest in identifying effective methods for teaching children with ADHD is becoming more common. For example, Skoning (2008) suggests the use of visual-motor and kinesthetic approaches to educate and encourage the creative development of children with cognitive disabilities. Many students who exhibit behaviors that challenge their teachers may be kinesthetic learners. These students have difficulty staying in their seats, facing the front of the classroom, and often need to fidget or move during the lesson.

All students, especially those with ADHD, need exercise (Mulrine, Prater, & Jenkins, 2008). Activity assists children with ADHD with concentration and provides an outlet for proper impulse discharge, helping to control impulsivity. Movement helps reduce problematic classroom behavior and better focus students' attention on instruction. Mulrine et al. (2008) found that exercise helps students cope more effectively with stress, promotes a positive self-image, and improves thought patterns.

ADHD is the most commonly diagnosed behavioral disorder in children that occurs in all cultures and knows no boundaries (Mayers, Calhoun, Crowell, 2000; Mulrine, Prater, Jenkins, 2008; Salend, Rohena, 2003). There are 9.5 million adults in the United States that have been diagnosed with ADHD (CDC, 2015, para 3). In 1985 there were between 650,000 and 750,000 individuals diagnosed with ADHD. In 1990, there were between 850,000 and 950,000 individuals, and by 2000, there were 4 to 5 million individuals—mostly school-age children—diagnosed with ADHD. From the total number of children with ADHD, 75-85% were treated with psychostimulants, such as Ritalin and

Adderall. Psychostimulants improve ADHD symptoms in about 70% of adults and 70% to 80% of children. They tend to reduce interruptive behavior, fidgeting, and other hyperactive symptoms, as well as help a person finish tasks and improve his or her relationships (CDC, 2015, para.4). In 1991, doctors wrote approximately 2.5 million prescriptions for Ritalin and related drugs. In 2000, the number had increased to about 20 million prescriptions (Mayes, 2002, para. 2).

Estimates are that between three to seven of every hundred students will be diagnosed with ADHD (Pierangelo & Giuliani, 2008). Although for many years, ADHD was considered a childhood disorder appearing around the age of three and extending until adolescence, more recent studies have shown that ADHD stretches onward into adulthood making prevalence estimates in the total population challenging to determine (Pierangelo & Giuliani, 2008).

Data from the 2003 and 2007 National Survey of Children's Health (NSCH) reflect the increasing prevalence of treatment by health care providers as well as parent-reported attention-deficit/hyperactivity disorder (ADHD). The highest relative increases were among girls, children, and adolescents 11 to 14 years of age, whites, and children living in the Midwest (CDC, 2014).

Despite rising public awareness of ADHD, less than half of children who met DSM-IV ADHD criteria reportedly had their conditions diagnosed by a health care professional or been treated with medications. Girls were less likely to have their disorder recognized, and the most impoverished children were least likely to receive consistent ADHD medication and treatment (CDC, 2014).

ADHD is consistently linked with substantially elevated educational costs and with a significant economic burden on education and health. Its substantial burden of disease is evidenced by an increased likelihood of serious accidents, earlier mortality rates, substance dependence, criminality, and incarceration (Young et al., 2018).

When it comes to education costs, one study reported the annual ADHD-related costs of education in 3 to 4-year-olds at $12,447 per student. This included costs related to special education, occupational, speech, and physical therapy (Doshi et al., 2012). The annual cost in 5 to 18-year-olds ranged from $2,222 to $4,690 per student. This estimate included costs related to special education, grade retention, and school counseling. It also included costs related to special education, grade retention, and disciplinary incidents. Doshi et al. (2012) also reported that individuals with ADHD were significantly more likely to report poorer grades in high school, less likely to graduate from high school or college, or less likely to have completed a postgraduate degree compared with control subjects. Appropriate policies or interventions need to be targeted in childhood/ adolescence to increase the potential for improving educational milestones and decreasing workforce productivity losses in adulthood (Doshi et al., 2012).

Public education at the elementary and secondary level in the United States is the responsibility of the federal, state, and local governments. The federal government provided assistance to states and localities for the education of all handicapped children with the passing of the Education for all Handicapped Children Act (EAHCA) in 1975 (Colberg, 2010). EAHCA ensured that all handicapped children had available to them a free appropriate public education. Special education and other related services designed to meet their unique needs were also offered. The assurance of rights of handicapped

children and their parents also fell under the umbrella of EAHCA. Students diagnosed with ADHD were not offered services with the original EAHCA. Changes for ADHD students were made with future amendments to EAHCA, later renamed The Individuals with Disabilities Act (IDEA).

In 1991, the Department of Education adopted IDEA Part B that stated a school must provide appropriate educational services to students identified as having ADHD when their ADHD adversely affects educational performance (Kidsource, 2009, para. 4). This policy clarified what the responsibilities of the state were under federal law. The Department of Education ensured that the academic needs of these children would be met either through general or special education programs (Kidsource, 2009).

Section 504 of the Rehabilitation Act of 1973 and The Individuals with Disabilities Act (IDEA) of 1975 were put in place to ensure that a child with ADHD receives a free and appropriate public education. If ADHD affects a student's educational performance, services for special education are offered (Colberg, 2010). If a student's academic performance is not directly affected, but there are signs that this disorder is impacting school, the course of action would be to develop a plan of action consistent with Section 504 (Kidsource, 2009). This might be the case if a student does not have failing grades but does require extra time to complete classwork or tests. IDEA is a federally mandated law that governs the education of students with disabilities based on six principles. School districts must evaluate students fairly to determine if they have a disability and educate all students with disabilities, regardless of the nature of the disability. The school district must also provide an individually designed education for students with disabilities outlined in students Individualized Education Programs (IEPs)

at no cost to the students' families. Students with disabilities must be educated with their peers without disabilities to the maximum extent possible, and families must be provided with a process for contesting decisions and actions made by schools concerning the education of students with disabilities. Finally, according to IDEA, schools must take steps to involve parents and students in designing and delivering special education programs and IEPs (Kidsource, 2009, para.6).

Students with Attention Deficit Disorder with or without Hyperactivity (ADD/HD), who do not qualify for services under IDEA with a 22-point discrepancy between their Intelligence Quotient (IQ) and academic achievement scores, may be eligible for services under Section 504. Section 504 is a civil rights law that has a broader definition of disability than IDEA. Section 504, like IDEA, requires schools to offer eligible students a free and appropriate education within the least restrictive environment. Both laws also require that the student's families be informed and involved in the identification, evaluation, and service delivery process. However, Section 504 does not require parental permissions. Students who qualify for 504 services are not required to have an IEP. They must receive accommodations to meet their educational needs, outlined in an individualized accommodation plan (Salend & Rohena, 2003).

Currently, recommendations for treatment of students with ADHD include an individualized approach involving parents, teachers, counselors, and the school. According to the American Academy of Pediatrics (2014), there are new guidelines guiding diagnosis and treatment for childhood ADHD, including interventions, psychopharmacology, educational modifications, skill training, and social support.

Despite their best efforts, children with ADHD often do poorly or fail in their academic and social environments (Al-Karagully, 2006). Being able to recognize the uniqueness of every student and their learning style can help the teacher to promote personal development as well as classroom development. The inherent disadvantage of the traditional curriculum is the idea that one size fits all. There are interventions designed for students with attention disabilities, but these interventions are often not progressive or sufficient enough to overcome the conventional, well-practiced classroom setting. Students with difficulties are left still trying to reach their full academic achievement. Being successful in school, getting along with other children or adults, and finishing tasks at home are all things that can be difficult for children with ADHD (Carbone, 2001). Underachieving students learn differently than others. Therefore, using movement in the delivery systems that engage them in the learning process produce more positive outcomes. Current research has also uncovered Tactual and Kinesthetic approaches to learning that actively engage students in learning experiences and may produce more positive achievement gains when employed with underachieving students.

In understanding ADHD, it is essential to understand how ADHD affects students in the classroom and some appropriate ways a teacher can address these struggles. Physiologically, students with ADHD are born with a smaller prefrontal cortex than children born without ADHD. A smaller prefrontal cortex can lead to difficulty in utilizing one's working memory and exhibiting lower inhibitions in the classroom. Both of these are critical elements in being part of a traditional classroom (Pierangelo & Giuliani, 2008). Deficits in these areas often cause more significant problems in that 40% of pupils with this disorder experience suspension or expulsion because of the

disruptions they produce within the classroom (Pierangelo & Giuliani, 2008). If a child has lower inhibitions, there is often lower motivation to stay focused and on-task in class. This may cause students to act out, cause disruptions, and seek attention, deterring other students from learning. For example, as a part of learning, students need to be able to remember the steps and information previously given by the teacher. For a student with low working memory, this can be very difficult, primarily if the child is not engaged or is not working with one on one assistance. ADHD is likely to cause sloppy handwriting, incomplete or misplaced assignments, inconsistency in academic performance, and difficulty interacting with their peers. As the students grow older, they begin to demonstrate trouble in study skills, organization, prioritizing tasks, and reading comprehension contributing to an overall lack of self-esteem (Pierangelo & Giuliani, 2008).

In the school setting, Daley and Birchwood sought to address school achievement and ways in which to support children with ADHD (Daley & Birchwood, 2010). Their approach was to empower learners and educators to find realistic solutions to classroom management and learning difficulties. In their research, they drew two significant conclusions. First, students with ADHD lack prefrontal development that impacts their working memory and inhibition. Second, because of this, it is crucial for educators and parents to intervene on behalf of their students. They can do this in several ways. Beneficial interventions can be done through medication, peer and parent tutoring, changing instruction and task methods such as shortening a task or teaching in a way that a child with ADHD can better relate with, as well as changing procedures in the classroom to better fit student needs (Daley & Birchwood, 2010)

For many years, educators have noticed that some children respond better to specific methods of learning more other methods. Williams (2008) defines these methods or traits as different approaches or ways of learning. Kopsovich (2001) stated that learning styles identify the stimuli most conducive to student learning. Frank Riessman identified the style of learning as “the idiosyncratic style elements in the learning process” (Reissman, 1964, p.448). Even though learning is continual and developmental, no two individuals learn in the same manner. This is due to the variety of experiences of the individual, the way the experiences influence them, and the way they transform their experiences into learning.

Educators categorize students who require special attention into specific groups such as dyslexia, hyperactive or impulsive, reading difficulties. Children classified into these groups differ in the amount and type of attention they require from teachers. Teachers face many challenges in their daily effort to meet the needs and ensure success for a diverse group of students. This group includes students who are inattentive and have trouble staying focused and on task (Mulrine et al., 2008). According to Carbo & Hodges (1998), at-risk students have been found to learn best in an informal, highly structured environment with soft light. These students also tend to be less visual and auditory and have higher preferences for tactile-kinesthetic learning. This type of learning allows students to absorb information best by “doing, experiencing, touching, moving, or being active in some way” (Honigsfeld & Dunn, 2009, p. 223). When a student's preferred learning style does not match with classroom instruction, students feel anxious and stressed (Carbo and Hodges, 1998). Matching students' learning styles with the

appropriate instructional strategies improve the student's ability to concentrate and learn (Carbo, Dunn, &Dunn, 1986).

Teacher resistance to change can often be one significant reason for when reform fails (Zimmerman, 2006). Teacher buy-in is often hard to earn from the entry stage showing that teachers' past experience and belief in their expertise may lead to their resistance to change (Fullan, 2002; Silin & Schwartz, 2003; Zimmerman, 2006) It is broadly believed that principal practices have significant influences on the ways in which teachers implement reform programs (Desimone, 2002; Spillane, Halverson, & Diamond, 2004; Zimmerman, 2006). Research highlights that school administrators' support plays a critical role in enhancing teacher buy-in (Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006; Silin & Schwartz, 2003; Turnbull, 2002). Specifically, principals serve a pivotal role in both shaping a culture of compliance and strategically planning the effective implementation of reforms (Datnow & Castellano, 2000, 2001). School leadership is one element that can eliminate barriers in new curriculum and instruction, in turn enhancing teachers' beliefs (Kerr et al., 2006; Turnbull, 2002). If teachers are not comfortable with the school environment as they are asked to change their practices, it becomes challenging for them to welcome changes (Zimmerman, 2006).

Therefore, it is vital for school leaders to identify both weaknesses and strengths within the organization if they are going to understand their needs for school improvement better and prepare for changes in schools (Fullan, 2002; Zimmerman, 2006).

Statement of the Problem

Many factors contribute to general education teachers' perception of utilizing movement in the classroom for students with or without ADHD. Teachers must consider these when making instructional decisions in the classroom. The purpose of this study is to determine if certain factors affect the perceptions of teachers' willingness to utilize movement when it comes to increasing reading and mathematics learning.

Hypothesis and Research Questions

The research questions are as follows:

1. What is the relationship between teacher beliefs about movement and their intent to use it in the classroom?

2. What is the relationship between teacher beliefs about movement and their current use of it in the classroom?

3. Are teacher beliefs about using movement in the classroom related to teacher demographics?

Delimitations

Delimitations of this study are as follows: only public-school teachers over the age of 18 in Simpson and Rankin county whose names submitted to the Mississippi Department of Education personnel database were surveyed, data were only analyzed and collected during the 2018-2019 school year, only the factors of this survey instrument were researched to define the perception of public school teachers utilizing movement in the classroom as it influences academic achievement for students with ADHD.

Assumptions

Basic assumptions of this research study are as follows: the Mississippi Department of Education personnel database names are accurate and complete, the participants completed the survey with honesty, and the participants of the study are public school teachers in Mississippi.

Justification

This study adds to the knowledge base regarding what is known about kinesthetic and tactile movement as it influences academic achievement for students with and without ADHD. The results of this research could benefit public school teachers and offer insight for administrators as to if and how movement can increase academic achievement in students in the public-school setting.

CHAPTER II

REVIEW OF THE LITERATURE

How the Brain Learns

Cells within the nervous system, called neurons, communicate with each other in unique ways. The neuron is the basic working unit of the brain, a specialized cell designed to transmit information to other nerve cells or gland cells (D'Alto, 2008). Nerve cells, or neurons, are the basic building blocks of the brain. What makes neurons different from each other is the way they connect. Each neuron has dendrites, which look like long fingers, and a long extension called an axon. An axon acts like a tiny electrical wire. The space between a neuron's dendrites and a neuron's axon is called a synapse. Electrical signals cross this synapse using chemicals called neurotransmitters. These signals connect the neurons much like a giant spider web. The neural connections are what make memories. An experience causes your brain to connect a set of neurons. If you have the same experience again, the same bunch of brain wires gets activated again, and you remember. The difference between short-term and long-term memory has to do with the new synapse connections being weak. When an individual has the same experiences several times, these connections are strengthened, forming more enduring links transforming short-term memory into long-term (D' Alto, 2015).

Communication between neurons is necessary for an operating brain. Many messages come to the neurons, but only one message exits. In each synapse, there are chemicals. Some of the chemicals, like dopamine, serotonin, norepinephrine, and gabion, go from one synapse and provide data transportation by communicating with each other (Ozel et al., 2008). The brain allows transitions depending on experiences. The more it

experiences, the more it acquires data. Rich experiences increase the cortex thickness and the amount of individual chemical transmitters. The learner shapes his learning with his experiences and reprocesses the data in giving more meaning to these experiences. The student takes the data acquired by experiences into cognitive structures and makes them foundational for future decisions by building them upon previous ones.

Dr. John Ratey, the author of Spark: The Revolutionary New Science of Exercise and the Brain (2008), found that intense physical activity gives the brain a boost. Exercise causes the release of ANP (a peptide hormone) that turns on the frontal cortex for concentration. Exercise and plasticity are highly linked, according to Ratey (2008). Plasticity is the process where the brain produces new neuronal connections. New neuronal connections are what learning is all about. Everything you learn or remember stays in your mind because of new neuronal connections. The hippocampus generates a supply of brain factors with names like ANP, BDNF, VEGF, and mitogens, which are all growth hormones and chemicals produced in the brain. The prime source of these elements is physical exercise as they are created in the heart as it increases speed and the blood vessels as they are stressed. The factors then travel to the hippocampus and give the signal for stem cells to turn into neurons and make new connections.

Dr. Arthur Glenberg (2014) from the University of Arizona is an expert in the field of embodied cognition. This field of neuroscience posits that understanding the body and brain connection is imperative for understanding human thinking. It emphasizes sensory and motor function, as well as their importance for successful interaction with the environment (Wilson, 2002). There is a growing commitment to the idea that the mind must be understood in the context of its relationship to a physical body that interacts with

the world (Wilson, 2002). Some researchers state that if we can involve children physically in the learning process, we see better results, even in learning to read (Glenberg 2014; Wilson, 2002).

Successful education is dependent on a person's knowing his mental structure and using it effectively (Ozel, Bayindir, Ozel, & Ciftcioglu, 2008). The brain is the vital center in unifying, directing activities, receiving stimulants, and transforming them into reactions (Ozel et al., 2008). The hippocampus, situated in the middle of the brain, is the center of memory. It is the area that decides whether data will be transferred into long-term memory. In this area, synapses create other synapses when they are stimulated by electrical signals (Ozel et al., 2008). The data reaching us with electrical signals through various learning channels are stored according to their level of importance. The data we are not interested in is received in a lower level signal.

Establishing a classroom environment that encourages movement throughout the day and during lessons includes transitions, recess, and indoor activities. Movement helps reduce problematic classroom behavior and better focus students' attention on instruction. Mulrine et al. (2008) even suggested that keeping students from exercise may cause some classroom related problems. Exercise has been found to help students cope more effectively with stress, promote a positive self-image, and improve thought. Exercise has also been shown to increase activity in the parts of the brain involved in memory, attention, spatial perception, language, and emotion. There have been indications that movement can strengthen learning and memory and boost learner motivation and morale (Jensen, 2005). Jensen (2005) also discusses several hypotheses that may help explain why including movement may help students with their unique individual needs. He

explains that movement is a quick way to change the counter-productive mental state of many special-needs learners. Another hypothesis Jensen (2005) discusses is that movements, such as those involved in playing active games, activate the brain across a wide variety of ways. He suggests it may be the stimulation of the neural networks that help trigger learning. For other students, it may be the rise in energy, increased blood flow, or the amines (organic compounds) that put them in a better mood to think and recall (Jensen, 2005).

Exercise impacts oxygen levels in the brain, which affects brain chemistry, cerebral metabolism, and growth and development. Oxygen is essential for brain function. It enhances blood flow and increases the amount of oxygen transported to the brain (Mulrine, Prater, & Jenkins, 2008). Students can focus better when provided breaks throughout the day. Structured breaks from demanding cognitive tasks seem to facilitate both learning and social competence (Pellegrini & Bohn, 2005).

Research shows that the brain learns and stores new information through sensory cues (Lengel & Kuczala, 2010). The more senses used, the more likely the information will be acquired and stored. Sensory input must be present for information to be stored for future use. Learning through kinesthetic movement can provide an essential link between the content and its retention (Lengel & Kuczala, 2010). Ratey (2008) states that exercise enhances learning by improving attention and increasing alertness and motivation. It also encourages nerve cells to bond with each other, which is the basis for new learning. Finally, Ratey found that exercise also promotes neurogenesis, which is the development of new nerve cells (Ratey, 2008). Constructivism

Constructivism is a theory in which the learners create or construct new understanding by actively building upon prior knowledge and experiences (Yoders, 2014). According to West (2013), human beings construct knowledge for themselves in the context of their interactions with others. They learn by doing, by watching what goes on in the world around them, by interacting with others, and by actively seeking to make sense of all of these experiences (Yoders, 2014). Individuals are assumed to construct their meanings and understandings. This process is believed to involve the interplay between existing knowledge and new knowledge and experiences (Yilmaz, 2008). This view of constructed knowledge implies that 1) learners are intellectually generative individuals rather than empty vessels waiting to be filled, 2) instruction should be based primarily on developing learners' thinking, and 3) the learning authority lies in neither the teacher nor the resources but the interaction between teachers and learners (Yilmaz, 2008).

Learners start with a complex problem and work it out to discover the fundamental skills required to solve the problem. These skills involve learning in cooperative groups, experimentation, open-ended problems, and real-life experiences in which the learners discover learning on their own (Nagowah & Nagowah, 2009). Rather than using what the teacher knows, the student creates student knowledge in the learning process. The teacher encourages the students to discover by themselves after much discussion about the information (Brandon & All, 2010). The role of the learner is to transform information to construct ideas and make decisions. The role of the teacher is to guide activities that build on what students already know, use experiments, problem-solving, exercises, and dialog to create more knowledge and understanding (Brandon &

All, 2010). Constructivist teachers encourage students to assess continuously how the activity is helping them gain new understanding. Students learn strategies that help them become better learners through the scaffolding of questioning.

Jean Piaget was an influential experimenter and theorist in the field of developmental psychology and the study of human intelligence (Presnell,1999, para. 1). Piaget believed that children construct an understanding of the world around them and then experience discrepancies between what they already know and what they discover in their environment (Piaget, 1976, p. 12). Throughout Piaget's long active period of research, he remained faithful to the constructivist perspective. He developed his theory of knowledge based on ideas derived from biology (Baker, McGaw, & Peterson, 2007). Piaget established what was called a constructivist theory of knowledge and rejected the empiricist and behaviorist stance that knowledge is derived only from experiences (Baker, McGaw, & Peterson, 2007). He also dismissed the notion that knowledge is innate and develops as people grow.

Science educators began to take notice of Piaget's theories in the early 1970s. The attention was given mostly to his description of stages of intellectual development. Names like the psychomotor, concrete operational, and formal operational stage soon became part of everyday educational terminology (Kolb, 1984). Over time, his theory lost supporters. Critics' main arguments were that Piaget described tasks with confusing and abstract terms and used overly tricky tasks. In the early 1970s, research in mathematics and science changed gradually. There was a growing concern about the ideas that children develop about the world, and the term constructivism started to be used more frequently.

Rosalind Driver, a student of Piaget's, was a crucial person in the re-development of this constructivist movement (Baker, McGaw, & Peterson, 2007). She published articles and books meant for the classroom teacher that became highly influential in teacher training, research, and science classrooms. This reemergence of constructivism in the late 1970s and early 1980s triggered a flood of studies about students having their ideas. Piaget's ideas reemerged as a result.

Lev Vygotsky was a Russian psychologist who focused on the connections between people and the sociocultural context in which they act and interact in shared experiences. He believed that social interaction plays an essential role in the process of cognitive development. This differed from Jean Piaget's understanding of child development in which development precedes learning. Vygotsky believed social interaction preceded development. Vygotsky also developed the theory that children learn best in their Zone of Proximal Development (ZPD). Vygotsky describes the ZPD as the distance between a student's ability to perform a task under adult guidance or with peer collaboration and the student's ability in solving the problem independently (Moll, 1992). It was not until the latter part of the 1970s that his work began to get attention. Piaget and Vygotsky both contributed to the constructivist theory with their main differences being that Piaget was concerned with the epistemology and Vygotsky concerned with the social and cultural conditions for learning. Vygotsky's writings were more closely linked to education.

Jerome Bruner developed a theory that learning is an active process in which learners construct new ideas or concepts based on their current and past knowledge (Dowling, 2012). The learner uses cognitive structures such as schema and mental

models to provide meaning and organization to experience and to absorb information, discover, and develop individual solutions. Bruner believes that instructors should engage in active dialogue with students, encouraging their unique discovery of information. Three critical principles demonstrated in Bruner's learning model are; 1) instruction must be connected to student experience that makes students willing and able to learn, 2) instruction must be structured so that the student can easily understand it, and 3) instruction should be designed to fill in the gaps going beyond the information given (Dowling, 2012).

Among the most widely used learning-style inventories today is the Dunn Model created by Dunn and Dunn (Carbo, Dunn & Dunn, 2002). This model describes how the individual learns new or different material and how that is affected by several factors. The factors looked at in this model are the immediate environment, emotionality, sociological needs, physical characteristics, and psychological inclinations (Carbo, Dunn & Dunn, 2002). The immediate environment looks at the surroundings in which the student learns best. The surroundings include temperature, lighting, and other similar factors. Emotionality looks at motivation, perseverance, and the need for structure the student has. Sociological needs to deal with how the student learns best. This learning might be in small groups, with a peer partner, or in larger, more lecture-style classrooms. Learning style preferences come into play in the physical characteristics of the student. Sometimes that might be auditory, visual, tactile, or kinesthetic. The final factor addressed with the Dunn Learning Styles Inventory is the psychological inclinations of the student. The inclinations determine if the student has more global or analytic strengths when it comes to learning. (Carbo & Hodges, 1988)

LaShell (1986) worked with 90 learning-disabled students that resulted in reading comprehension gains when their learning style matched the instruction. Students whose learning styles did not match classroom instruction showed only small increases (LaShell, 1986). Kercood (1989) assessed the effects of gross motor physical activity before problem-solving in math for students with hyperactivity and inattention. His study showed that students improved in completing activities, increased their attention to detail and reduced impulsivity after engaging in physical activity. ADHD children respond to all stimuli, being unable to exclude those that are unnecessary for the situation. They pay more attention to external stimuli than the average person and are unable to stop the overwhelming flow of information (Carbone & Dunn, 2002).

Multiple Intelligences

New approaches to teaching are being put forward to eliminate difficulties in teaching and to meet the needs of students in different curriculum areas. Most of these approaches based on learning theories take into account the differences between students. The Multiple Intelligence Theory (MI) proposed by Howard Gardner in 1983 focuses on what we know about the brain, evolution and learning differences, and what human abilities are shared among all. In MI, Gardner goes beyond using the IQ score as the measure of academic intelligence. Gardner's theory takes into account the emotional and social bits of intelligence, with only a small percentage focused on IQ (Lane, n.d.).

Gardner's MI theory is based on the idea that everyone has different types of talents or knowledge. His eight intelligences are:

• Visual-Spatial-The individual can perceive the visual-spatial world accurately and modify or manipulate one's initial perceptions.

• Bodily-Kinesthetic-The individual has the abilities to control one's body movements and to handle objects skillfully.

• Musical-Rhythmical-The individual has the skills to produce and appreciate rhythm, pitch, and timbre and has an appreciation of the forms of musical expressiveness.

• Interpersonal-The individual has the capacities to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people.

• Intrapersonal-The individual has the knowledge of one's feelings, strengths, weaknesses, desires, and the ability to draw on their knowledge to guide behaviors.

• Logical-Mathematical-The individual has the abilities to discern logical or numerical patterns and to handle long chains of reasoning.

• Verbal-Linguistic-The individual has the sensitivity to the sounds, rhythms, and meaning of words as well as the sensitivity to the different functions of language.

• Naturalistic-The potential for discriminating among plants, animals, rocks, and the world around us, as used in understanding nature. (Gardner & Moran, 2006)

Gardner still considers several other learning intelligences, including existential intelligence, seen in individuals concerned with questioning life's meaning and issues of human existence (Vardin, 2003). Gardner believes that all human beings possess eight different intelligences and that each person has a unique blend of the intelligences. He believes that no two people have the same strengths and weaknesses (Vardin, 2003).

Gardner's MI theory can be implemented in curriculum development, planning instruction, selection of instructional activities, and related assessment strategies (Caine & Caine, 2000). Instruction designed to help students develop their strengths can also trigger their confidence to develop areas in which they are not as strong. Gardner asserts

that educators should not follow one particular theory in education. Instead, they should have customized goals and values related to their teaching and the students' need (Gardner & Moran, 2006).

Although the theory of multiple intelligences is relatively recent, the foundation for this idea is not. Examples of Gardner's multiple intelligences can be linked to ideas put forth by early childhood educators. Froebel, the father of kindergarten, had a philosophy that emphasized parts of the multiple intelligences. Froebel had his students focus on language development, eye-hand coordination, painting, and gardening (Rettig, 2005). Edward Sequin, an early pioneer in special education in the mid-1800's, suggested that the education of children needed to focus on real objects, sensory stimulation, active engagement, and the whole child (Rettig, 2005). Emphasis on the whole child is considered the mind, body, and spirit, which are directly related to the multiple intelligences. The work of Maria Montessori is also linked to Gardner's MI theory. Montessori emphasized child-directed learning, language, sensory learning, and the use of active engagement. Both Gardner and Montessori came to understand and appreciate the broad range of abilities and capacities found in human nature and to challenge the rigid and narrow beliefs about human nature (Vardin, 2003). The activities in Montessori's curriculum engage many of the core operations in the intelligences described by Gardner (Vardin, 2003).

The MI theory is also linked to more recent work on the brain and how it functions (Rettig, 2005). Education and a focus on the whole brain are now a topic of interest. According to Rettig (2005), this means focusing instruction on both the left and right hemispheres of the brain. Logical thinking, phonics, the naming of objects, verbal

memory, and sequencing of concepts are all associated with the left hemisphere (Rettig, 2005). The right hemisphere is related to non-verbal learning, drawing, body awareness, musical hearing, and emotional thought (Rettig, 2005). An approach to teaching that focuses on multiple intelligences will reach both hemispheres. The two human intelligences that have dominated traditional schooling are verbal-linguistic and logical-mathematical (Ozdemir, Guneysu, & Tekkaya, 2006). Studies with the Teele Inventory for Multiple Intelligence have revealed some information that could affect the way teachers provide information at different grade levels (Teele, 1996; Ozdemir, Guneysu, & Tekkaya, 2006). Primary students' most dominant intelligences were spatial, bodily-kinesthetic, linguistic, and logical-mathematical. Upper elementary students tended to be more spatial, bodily-kinesthetic, interpersonal, and musical (Gardner & Moran, 2006).

An emphasis on the multiple intelligences may help ensure the learning and retention of information longer than other approaches. It may also help children discover what they are good at and put a focus on their ability rather than areas in which they struggle. Addressing the education of children with disabilities through multiple intelligences may help educators to discover hidden talents.

The kinesthetic method of teaching relies on the students' ability to discover their learning and individual capabilities. The kinesthetic avenue of learning incorporates not only the idea of feedback given by the teacher but also the examination and processing of information the learner receives from doing movement (Enghauser, 2007). Understanding the world through the body is known as bodily-kinesthetic intelligence (KI). People with high KI can use their body in highly expressive skilled ways for a distinct purpose. Teaching children with this intelligence is optimized through the use of manipulatives

and physical movement (Walter, 2009). With kinesthetic learning, implicit feedback is received from only doing the movement as opposed to explicit feedback given by the teacher. Teachers use kinesthetic learning to stimulate children to find and develop their resources, not to bombard them with information and skills. The teacher should be the motivator with his/her methods designed to encourage children to be active in their learning. Kinesthetic learning is not a new theory. John Dewey's method of teaching discusses the idea that the school should not provide "schooling" but "educate" the student. Dewey believed that the individual could question through experience that is most important for humans (Glassman, 2001). Dewey emphasized human inquiry and the role that it plays in the creation of experience. Children learn that they control inquiry in their lives and determine what goals are important to them (Glassman, 2001). Maria Montessori, an Italian physician, and educator, is known for her philosophy of education named after her, also believed that the key to learning is the student. She believed that the teacher should act as the stimulator. Montessori developed a kinesthetic approach to teaching reading and writing (Montessori, 1912, p. 262). Montessori's child-centered educational approach was based on the scientific observations of children from birth to adulthood. Her approach views the child as one who is naturally eager for knowledge and capable of initiating learning on his/her own (American Montessori Society, para. 3). Montessori (1949) explained education by saying, "It is not acquired by listening to words, but in virtue of experiences in which the child acts on his environment" (Montessori, 1949, p. 7).

Kinesthetic movement has the potential to increase students' sensory awareness and heightened perception through tactile learning (Dowling, 2012). Establishing use of

the body within the curriculum has many advantages. More ownership, experimentation, and innovation lead to a greater sense of self and more profound, sustained experiences.

Brain-Based Learning

According to Caine and Caine (2000), there are twelve core principles of brain-based learning. When the body, brain, and mind are united, it becomes possible to identify general core aspects of how the brain learns. Caine and Caine (2000), explained the development of a set of principles for education by stating, "Because we view a person as an integrated system in which everything interacts with and influences everything else, for the last twenty years we have been developing a set of principles for educators that encapsulate the ways in which the different aspects of body, brain, and mind participate in the learning process" (p. 5).

Caine and Caine had four primary criteria in mind when creating the twelve principles. These measures were derived to improve education. The phenomena described by a principle should apply to all human beings, come out of research from several different disciplines, anticipate future research, and have relevant implications for educational practices (Caine & Caine, 2000). The twelve principles show how the person is an integrated system in which everything interacts with and influences everything else. They show how the body, brain, and mind participate in the learning process (Caine & Caine, 2000). The twelve principles incorporate that all learning engages the physiology and involves both focused attention and peripheral perception, the brain is social, the search for meaning is innate and occurs through patterning, emotions are critical to patterning, learning is both conscious and unconscious and the brain processes parts and wholes simultaneously. Caine and Caine's twelve principles also state there are at least

two approaches to memory, learning is developmental, each brain is uniquely organized, and complex learning is enhanced by challenge and inhibited by threat associated with helplessness and fatigue (Caine & Caine, 2000).

Each of these principles references students' capacity to comprehend, learn, and make sense of experiences. All students can comprehend more effectively when their needs for social interaction are fulfilled when they are involved in engaging experiences that utilize all of the senses and body, and when their attention is deepened by interest, emotion, and meaning (Caine & Caine, 2000). Making sense of experiences requires not only the ability to focus on the small parts but also the larger picture. Students require the time to reflect on and process their experiences. Everyone has different experiences, and most of these are unique to each individual. When these unique talents, abilities, and experiences are engaged, students comprehend more effectively.

Brain-based education is the use of teaching strategies derived from the knowledge of how the brain functions (Nwokah, 2013). Brain-based learning is the ability to make changes to the brain connections when knowledge is acquired through real-life situations (Nwokah, 2013). According to Gozuyesil and Dikici (2014), knowing how the brain works maximizes learning. Investigating the relationship between the brain, the neural system, and cognitive behaviors, has increasingly supported brain-based learning. Ozel, Bayindir, Ozel, and Ciftcioglu (2008), stated that the brain operates like a data processing module. A learner waits for stimulations coming from the outside environment with his/her mind ready to make connections and construct its meaning. Ozel et al. (2008) also explained that genetic, development, and environmental factors determine the main structure of neurons determining human behaviors. Environmental

factors and learning cause new synapses to form in the brain continually. If there is not a failure in this brain process, new cells can be developed, and their quality can be improved (Ozel et al., 2008). Research indicates that children raised in rich stimulant environments learn faster. Multiple experiences cause both an increase in synaptic connection and thickening of the cortex (Ozel et al., 2008). Brain-based learning distinguishes between meaningful and surface knowledge. Although memorization can be significant, meaningful knowledge is critical for being successful. Brain-based learning is centered on learning that is meaningful in the context of lifelike, enriching experiences (Kahveci & Ay, 2008). Providing students with the safety and opportunity to learn meaningfully is what brain-based learning is centered around. According to Goswami (2008), learning is incremental, experience-based, and multi-sensory. Goswami believes that it is never too late to learn, given what we now know about the brain's plasticity.

Related and Unrelated Movement

Beaudoin & Johnston (2011) proposed using unrelated and related movement in the classroom. Unrelated movement is defined as a movement that is not explicitly related to the content instruction. Related movement, on the other hand, is considered to be directly related to the content being taught. The purpose of Beaudoin & Johnston's study was to determine the impact of purposeful movement in high school Algebra classes. Learner outcomes and attitudes were assessed in two Algebra II classes from an inner-city high school. The two classes received the same instruction with the exceptions to purposeful movement, which was incorporated into the treatment group's lesson. The purposeful movement consisted of cutting out and physically moving a parabola to demonstrate transformations of quadratic functions (Beaudoin & Johnston, 2011). A post-

test was administered to both groups to measure learning and assess student attitudes. The treatment group's gains on the posttest had a mean of 84%, compared to the control group's mean gain of 65.9%. Also, on the posttest, 18.18% of the control group graphed a parabola for the quadratic function question, while 85.71% of the students in the treatment group did so. The group who utilized purposeful movement during the lesson rated their experience more favorably than the group that did not have the movement experience (Beaudoin & Johnston, 2011). The study strongly suggests that content related movement increased student understanding, retention, and attitude.

Jodi Peebles did an additional study incorporating movement in the classroom in 2007. Peebles (2007) used two fluency strategies in her reading programs that involved movement, which proved to be motivational and useful for students in grades two through six in both regular and special needs literacy classrooms. The first strategy used was Readers Theater, which involves rehearsing a passage, incorporating movements such as actions, gestures, facial expressions, and presenting it to an audience. Enhanced comprehension took place when students interpreted the actions and the feelings of the characters they had become. The second strategy Peebles incorporated is known as Rhythm Walks. Rhythm Walks purpose is to draw attention to the natural breaks and phrasing of text through purposeful steps or movements. The repetition helps build both fluency and comprehension (Peebles, 2007). Reading teachers had an increased awareness of the benefits of fluency instruction and repeated reading. The task is to implement these strategies now in ways that are practical and motivational. Motivation is particularly essential for struggling and reluctant readers because they often require repeated opportunities for effective instruction to begin demonstrating improvements.

The brain's capacity to learn and hold the motivational appeal to endure intensive and extensive repeated reading methods increases when movement is utilized in fluency instruction (Peebles, 2007).

A strong association between children's use of gestures and improved learning is shown in a study conducted by Cook, Mitchell, and Goldin-Meadow (2008). Using a pre/post-test design, third and fourth-grade children were randomly assigned to one of the three conditions: speech with no gestures, gestures, and gestures, and speech. Children who used their hands to learn new concepts retained 85 percent of their post-test gains four weeks later compared to 33 percent for children told to speak and not gesture (Cook et al., 2008). Researchers speculated that gesture constitutes a way of representing new ideas. These ideas require little effort to produce, and thereby free the brain's resources for encoding new information in a more lasting format (Cook et al., 2008).

A study conducted by Block, Parris, & Whiteley (2008) also showed how gestures could be utilized in the classroom. Comprehension Process Motions (CPMs) are used for young readers to learn comprehension processes and to develop their abilities to use them without being prompted by the teacher. The lessons using CPMs enhance understanding of how comprehension process work, when and where to use them, and how to use each one independently (Block et al., 2008). CPMs are kinesthetic hand movements that represent the abstract, unseen comprehension processes such as finding the main ideas, inferring, making predictions, and clarifying. The lessons utilizing CPMs are designed so that children can internalize comprehension strategies through dual-coded learning inputs. These lessons stimulate students' active learning and provide young readers with

detailed images to learn how, when, and where to initiate comprehension processes (Block et al., 2008).

When a student has a question about something and needs clarification, they first place both hands together and then open them and splay the fingers. This symbolizes that at first, their mind was closed to the meaning, and then when their mind opens up to see new meaning, it completes a thinking process. When a student makes an inference about things the author did not write down, they lift their right arm to the side of their waist. This is the starting point. The student then moves the right hand to the left across the body to the left side of the waist. This shows the movement of thoughts forward to a broader idea to which these facts lead. There are also movements associated with finding the main idea and making predictions.

CPM lessons were designed to overcome many limitations with teaching in the traditional school setting. First, students are often asked to answer basic comprehension questions after a silent or shared reading lesson. The weakness with this is that the students merely become passive recipients of basic knowledge. The teacher usually acts as the independent authority of the students' interpretation of the text. Second, many educators are unsure of how to teach different comprehension strategies in a way that shows students how these strategies work together to help them understand the text. Teachers will often show the students how a comprehension strategy works once or twice, but then it is up to the student to use this information independently. Third, even after several months of teaching comprehension strategies, students are not likely to use these strategies without prompting from their teacher. Lastly, after repeated comprehension failures, students who struggle with reading will retreat to reading where

only minimal meaning is attained (Block et al., 2008). Research findings such as these indicate that better methods of teaching comprehension strategies are needed. Results from using CPM trials showed the experimental group outperformed the control group in their abilities to infer, draw conclusions, find the main idea, and identifying the authors' writing patterns. Students who used CPMs significantly outperformed students who were taught the same processes without the assistance of the kinesthetic teaching aids (Block et al., 2008).

Movement with no connections to the curriculum being taught has also been shown to improve student achievement. Movement has been identified as an appropriate type of intervention for students with and without attention issues. Molloy (1989) evaluated the effects of gross motor physical activity in the form of 5-minute aerobic exercise before math problem solving for students with hyperactivity and inattention. He found improvements in attention and on-task behavior. This study reinforced that ADHD students have improved attention and task completion, reduced impulsivity, and disruptive behavior after engaging in motor activity (Molloy, 1989). One limitation of the Molloy study was that it only addressed antecedent motor activity. Physical activity was performed before performing the math task.

Stalvey and Brasell (2006) investigated the effects of allowing sixth-grade students in a Georgia school to use stress balls during direct instruction and independent practice. Students from 29 language arts classrooms were videotaped and observed for three weeks before the intervention and for seven weeks when they used the stress balls. Stalvey and Brasell (2006) found that traditional strategies for effective classroom management such as giving additional attention, using frequent eye contact, ignoring

misbehaviors, providing correction for negative behaviors, and providing increased structure and frequent reminders were unsuccessful in reducing distractions. By providing students with an appropriate method of coping with fidgety and impulsive behavior, the teacher is reinforcing on-task behavior and also teaching students appropriate behaviors to replace the inappropriate ones. Twenty-one students wrote paragraphs both before and after the intervention, and these were compared using the Wilcoxon Signed Rank Test. The mean writing score of the class increased from 73% to 83%. The student with ADHD experienced the most gain with an increase of 27%. This supports findings that movement therapy helped students with ADHD focus and learn. Nineteen of the 29 students also expressed that the stress balls helped them write by calming them down and helping them concentrate.

Kercood (2007) conducted a study to assess the effects of small motor activity during an academic task. Students were given a "Tangle Toy" for physical activity and tactile stimulation. The students were told how to utilize the Tangle Toy while they worked on math problems during a twenty to thirty-minute time frame. Results from the study showed that students performed better with fine motor activity with tactile stimulation answering more questions correctly. Students also engaged in less off-task behavior during the intervention with the Tangle Toy.

In their study, Carson, Shih, & Langer (2008), examined the effects of varying the novelty of a situation on the attention and learning of a stimulus in students from a traditional and non-traditional school. Students from a traditional elementary school, as well as students from a Montessori type elementary school, were used in this study. Fifty-five students from each school in grades three through five were randomly assigned to

one of the three testing conditions; sitting still, walking around, or shuffling feet while seated in a desk. The students were asked to identify various landmarks on an 8-10 foot map. They were told to pretend they are on a trip around the world. The students in the sit still condition group were asked to identify landmarks based on what they saw from a single perspective. The second condition group was told they could walk back and forth between two strips of masking tape 7 feet apart about 10 feet in front of the map. Walking back and forth allowed the students to view the map from more than one perspective. The final condition group was asked to shuffle their feet back and forth in their desk. This was meant to simulate walking by raising the student's heartbeats. Following the task, each student was interviewed and asked to fill out a short questionnaire.

Results showed that students from the traditional school in the walk condition identified more landmarks than the students in the sit still condition. Students in the shuffle condition scored between the other two groups when it came to identifying landmarks. However, students in the shuffle group scored the lowest when it came to identifying locations on the map. Teachers identified six students as having either a diagnosis of ADHD or difficulties paying attention. Of these children, three had been randomly assigned to the walk condition, one to the shuffle condition, and two to the sit still condition. The ADHD children in the walk condition identified an average of two more landmarks and four more locations than the children in the sit still condition (Carson, Shih, & Langer, 2008). It appeared that viewing the map from varying perspectives increased attention to and memory for the components of the map. Carson et al. (2008) found it encouraging that the children who had been diagnosed with attention

problems demonstrated even more significant increases in landmark and location scores in the walk condition that did the sample as a whole. They found that children with ADHD do benefit from the added novelty derived from a multi-perspective view of learning materials. This research indicates that varying the perspective from which a potential learning stimulus is viewed enhances memory for both the individual parts of the stimulus and the big picture (Carson et al., 2008).

Attention-Deficit/Hyperactivity Disorder

In understanding ADHD, it is essential to understand how ADHD affects students in the classroom and some appropriate ways a teacher should address these struggles. Physiologically, students with ADHD are born with a smaller prefrontal cortex than children born without ADHD. A smaller prefrontal cortex can lead to difficulty in utilizing one's working memory and exhibiting lower inhibitions in the classroom. Both of these are critical elements in being part of a traditional classroom (Pierangelo & Giuliani, 2008). Deficits in these areas often cause more significant problems in that 40% of pupils with this disorder experience suspension or expulsion because of the disruptions they produce within the classroom. If a child has lower inhibitions, there is often lower motivation to stay focused and on-task in class. This may cause students to act out, cause disruptions, and seek attention, deterring other students from learning. For example, as a part of learning, students need to be able to remember the steps and information previously given by the teacher. For a student with low working memory, this can be very difficult, primarily if the child is not engaged or is not working with one on one assistance. ADHD is likely to cause sloppy handwriting, incomplete or misplaced assignments, inconsistency in academic performance, and difficulty interacting with their

peers (Pierangelo & Giuliani, 2008). As the students grow older, they begin to demonstrate trouble in study skills, organization, prioritizing tasks, and reading comprehension contributing to an overall lack of self-esteem (Pierangelo & Giuliani, 2008).

Prevalence of ADHD

Estimates are that between three to seven of every hundred students will be diagnosed with ADHD (Pierangelo & Giuliani, 2008). Although for many years, ADHD was considered a childhood disorder, appearing around the age of three and extending until adolescence, more recent studies have shown that ADHD stretches onward into adulthood, making prevalence estimates in the total population challenging to determine (Pierangelo & Giuliani, 2008).

In the school setting, Daley and Birchwood sought to address school achievement and ways in which to support children with ADHD (Daley & Birchwood, 2010). Their approach was to empower learners and educators to find realistic solutions to classroom management and learning difficulties. In their research, they drew two significant conclusions. First, students with ADHD lack prefrontal development that impacts their working memory and inhibition (Daley & Birchwood, 2010). Second, because of this, educators and parents must intervene on behalf of their students. They can do this in several ways. Beneficial interventions can be done through medication, peer and parent tutoring, changing instruction and task methods such as shortening a task or teaching in a way that a child with ADHD can better relate with, as well as changing procedures in the classroom to better fit student needs (Daley & Birchwood, 2010).

Treatment Options

According to The Office of Special Education and Rehabilitation Services of the U.S. Department of Education, many treatment options have proven to be useful for children with ADHD. Effective strategies include behavioral, pharmacological, and multimodal methods.

Behavioral approaches represent a broad set of specific interventions that have the common goal of modifying the physical and social environment to alter or change behavior (ED, 2003). They are used in the treatment of ADHD to provide structure for the child and to reinforce appropriate behavior. In general, these approaches are designed to use direct teaching and reinforcement strategies for positive behaviors and immediate consequences for inappropriate behavior (ED, 2003). Behavioral strategies may be appealing to parents and professionals for the following reasons:

* Behavioral strategies are used most commonly when parents do not want to give their child medication;

* Behavioral strategies can also be used in conjunction with medicine;

* Behavioral techniques can be applied in a variety of settings including school, home, and the community; and

* Behavioral strategies may be the only option if the child has an adverse reaction to the medication (ED, 2003).

Behavior therapy is effective only when it is implemented and maintained. Indeed, behavioral strategies can be difficult to apply consistently across all of the settings necessary for it to be maximally effective. Although behavioral management programs have been shown to enhance the academic performance and behavior of

children with ADHD, follow up, and maintenance of the treatment is often lacking (ED, 2003). Some research has shown that behavioral techniques may fail to reduce ADHD's core characteristics of hyperactivity, impulsivity, and inattention. Conversely, one must consider that the problems of children with ADHD are seldom limited to the core symptoms themselves (ED, 2003).

Pharmacological treatment remains one of the most common yet most controversial forms of ADHD treatment (ED, 2003). Pharmacological treatment includes the use of psychostimulants, antidepressants, anti-anxiety medications, antipsychotics, and mood stabilizers. Stimulants predominate in clinical use and have been found to be effective, with 75 to 90 percent of children with ADHD. Although the positive effects of the stimulant medication are immediate, all medications have side effects. It is important to note that along with parental consent, the decision to prescribe any medicine is the responsibility of medical – not educational – professionals (ED, 2003).

Research indicates that for many children, the best way to mitigate symptoms of ADHD is the use of a combined approach (ED, 2003). A study done by the National Institute of Mental Health (NIMH) in 2003 followed 579 children between the ages of 7 and ten at six sites nationwide and in Canada. The researchers compared the effects of four interventions: medication, behavioral intervention, a combination of medication and behavioral intervention, and no intervention community care. Of the four interventions investigated, the researchers found that the combined medication/behavior treatment and the medication treatment worked significantly better than behavioral therapy alone or community care alone at reducing the symptoms of ADHD (ED, 2003).

The conditions associated with ADHD cause or exacerbate many learning, social, and emotional problems (Brand, Dunn, & Greb, 2002). Students diagnosed with ADHD seem capable of learning, but their hyperactivity, impulsivity, and inattention make concentrating difficult and negatively affect their performance. Sitting still, waiting their turn, paying attention, and staying with a task until completed are all actions teachers demand. Children who struggle significantly with these types of tasks usually have trouble doing well in traditional school settings. Often, it is the children with ADHD that suffer the greatest in traditional schools because they have a hard time conforming to the demands asked of them by the classroom teacher. As a result, children with ADHD are often reprimanded by their teachers and develop low self-esteem, compounded by a lack of school success (Brand, Dunn, & Greb, 2002).

ADD is officially called Attention-Deficit/Hyperactivity Disorder, or ADHD (American Psychiatric Association, 1994), although most people still call it ADD. The disorder's name has changed as a result of scientific advances and the findings of particular field trials. Attention deficit hyperactivity disorder (ADHD) is one of the most common childhood brain disorders (Mulrine, Prater, & Jenkins, 2008; Al-Karagully, 2006; Mazza, 2014; O'Brien, 2011; Salend & Rohena, 2003). ADHD is usually diagnosed in childhood and can continue into adulthood. Some individuals show enough improvement after puberty that they no longer need medication, but the American Academy of Family Physicians reports that two-thirds of children with ADHD continue to struggle with the condition throughout adulthood (Carbone, 2001). Brain images of children with ADHD revealed that the brain seems to mature in a typical pattern but is delayed by about three years in the prefrontal brain areas (Carbone, 2001). According to

Jensen (2005), most brains are physically mature between the ages of 18 and 30. However, it takes boys until about age 24 to catch up to girls' brain development.

There are many commonly held beliefs regarding the cause of ADHD (or ADD) symptoms. Parents, teachers, and caregivers may blame poor parenting, too much sugar, too much television viewing, or poverty and chaos within the child's family as the cause of the disease. There is no research to support these claims. While these factors may make a child's symptoms worse or increase in frequency, they are not the root cause. Researchers do not know the cause of ADHD; however, scientists are researching many possible causes. There does seem to be a genetic link for ADHD, and possible links to brain injury, environmental exposures (like lead), alcohol and tobacco use during pregnancy, premature delivery, and low birth weight (Alspaugh, para.3).

The American Psychiatric Association's Diagnostic and Statistical Manual, Fifth Edition (DSM-5) is used by mental health professionals to help diagnose ADHD. These diagnostic standards help ensure that people are appropriately diagnosed with and treated for ADHD. Using the same standards across communities will help determine how many children have ADHD and how this condition impacts public health.

There were some changes in the DSM-5 for the diagnosis of ADHD. The previous guidelines covered children 6-12 years of age. The current guideline covers children 4-18 years of age. New descriptions were added to show what symptoms might look like at older ages. Adults and adolescents age 17 or older must display 5 or more symptoms from the current guidelines, whereas 6 or more symptoms are needed for younger children to receive a diagnosis (Center for Disease Control [CDC], 2014).

Several symptoms of inattentiveness must be present for the diagnosis of ADD/HD. The student often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities. They often have trouble holding attention on tasks or play activities, do not seem to listen when spoken to directly, and often do not follow through on instructions failing to finish schoolwork, chores, or duties in the workplace. As a result, the student has trouble organizing tasks and activities, leading to avoidance, dislike, or reluctance to do tasks that require mental effort over a long period. Individuals may display inattentive symptoms, hyperactivity symptoms, or a combination of the two.

There are three different types of Attention-Deficit/Hyperactivity Disorder (ADD/HD) based on the characteristics exhibited by the student. The first type is a combination of hyperactivity and impulsivity and is associated with constant motion. Children with this type only show symptoms of hyperactivity and impulsivity, but do not have problems with inattentiveness. This is the least common type of attention deficit disorder. It shows the students' hyperactivity, impulsivity, distractibility, and disorganization. In the classroom, students display behaviors such as fidgeting, squirming, calling out, being out of their seats, and interrupting others.

The second type is known as the Predominately Inattentive type. This type was formerly called Attention Deficit Disorder (ADD). The student displays inattentiveness without hyperactivity. Students' inattentiveness is related to their distractibility and preferences for internal events rather than their need for frequent movement. These students tend to be characterized as paying attention to extraneous information and stimuli, appearing tired or shy, and daydreaming.

Students with the third type of ADHD make up the largest group. They are the students with a mix of hyperactivity, distractibility, and impulsivity known as the Combination Type. Students with this type of ADHD have the same number of symptoms from both the inattentive and hyperactivity list. They may have difficulty finishing tasks, following directions, and may fidget and talk a lot. It may be challenging for them to take turns, and they may grab things from other people; they may speak at inappropriate times and may act impulsively (Alspaugh, para.2).

In all three kinds of ADD, students' inattentiveness, disorganization, and reduced motivation interfere with their learning and academic performance, their social interactions, and their emotional development.

History of ADHD

The first mention of ADHD symptoms was in a poem by Heinrich Hoffman in 1865 when he wrote about "fidgety Philip as one who won't sit still, wriggles, giggles swings backward and forward tilts up his chair growing rude and wild" (Myttas, 2001, p. 1). In 1902, an English pediatrician named George Still described what has become known today as ADHD. He defined 20 to 43 children as being defiant, resistant to discipline, exceedingly emotional, and passionate. These children showed signs of having serious issues with attention and were unable to learn in school. (Myttas, 2001).

During the late 1800s, critics pointed to the schools as a contributing factor in childhood diseases, ill health, and mental stress. Newspapers throughout the country wrote about study-related illnesses (Mazza, 2014). The newspapers described students becoming extremely ill due to over-studying. This study-related illness epidemic became so severe that the ambitious students who feared missing school because of their

competitive nature attended despite being ill. They would attend school without regard to others' health.

Throughout this time and into the 1900s, teachers and doctors wrote about nervousness among students. Children were known as being naturally spontaneous, and play was seen as a possible solution to the nervousness problem. Many people agreed with Stanley Hall when he said that "play was revered for making children and adolescents moral and strong via direct and efficient processes, unlike the passive, unfocused, and feminized school curriculum" (Playground Professionals, para. 9). This type of passive, unfocused, and feminized schooling is what led physical education leaders to mandate physical activity in the future (Mazza, 2014).

In the early 20th century, ADHD was known as the "adenoid craze." Scientists believed that adenoid growth in the nasal passage was a disorder called Aprosexia. Aprosexia was thought to cause childhood inattention and disobedience. During the first two decades of the twentieth century, adenoidectomy briefly became the solution to the problems facing teachers and society. There were no significant changes in student inattention and disobedience because of the adenoidectomies performed during this time. Adenoidectomy is the surgical removal of the adenoids for reasons including impaired breathing through the nose, chronic infections, or recurrent earaches. Following the adenoid craze was the notion that the school and teachers caused nervousness. Reforms to teaching methods and curriculum followed shortly (Myzza, 2014).

Following an encephalitis epidemic in 1917 that affected approximately 20 million people, ADHD was referred to as "post-encephalitic behavior disorder" (Turner & Walls, 1998). The disease was thought to damage the patients physically or mentally

irreversibly. Many of the affected children who survived the encephalitis epidemic, subsequently showed remarkably abnormal behavior. Children often became hyperactive, distractible, irritable, antisocial, destructive, unruly, and unmanageable in school. They frequently disturbed the whole class and were regarded as quarrelsome and impulsive, often leaving the school building during class time without permission. Many of the children who survived this epidemic showed symptoms that today are considered part of the diagnoses of ADHD (Turner & Walls, 1998).

Since the early 1980's, the most prominent word featured in the name Attention Deficit Disorder is "attention." The description before this was "incorrigibles," "brain-damaged," "hyperkinetic," and "Minimal Brain Dysfunction (Myttas, 2001, para.5). In the 1950s, children who showed signs of ADHD were diagnosed as having "hyperkinetic impulse disorder." Hyperkinetic impulse disorder is characterized as a psychiatric syndrome emerging in early childhood that features an enduring pattern of severe, developmentally inappropriate inattention, hyperactivity, and impulsivity across different settings that significantly impair academic, social, and work performance (Colberg, 2010). The most apparent symptom of children with hyperkinetic disease was their unusual motor activity. In 1960, ADHD was classified as "Hyperactive Child Syndrome." It also defined activity as an essential component and separated the syndrome of hyperactivity from that of a brain damage syndrome (Turner & Walls, 1998, p. 2). The DSM-II in 1968 began to call it "Hyperkinetic Reaction of Childhood" even though the professionals were aware that many of the children diagnosed exhibited attention deficits without any signs of hyperactivity. The DSM-III, published in 1980, introduced the term "Attention-Deficit Disorder (ADD) with or without hyperactivity." In the DSM-IV,

published in 1994, presented ADHD with sub-types. This is what we use today to define and diagnose ADHD.

ADHD and the Brain

Brown (2007) defined ADHD as a highly heritable disorder with impairments related to problems in the releasing and reloading of two necessary neurotransmitter chemicals: dopamine and norepinephrine, which are made in the brain. These chemicals play a crucial role in facilitating communication within the neural networks that orchestrate cognition. Neuro-imaging of children with ADHD has shown a decreased size of the prefrontal cortex (Daley & Birchwood, 2010). There are expected deficits in specific prefrontal executive functions, such as response inhibition and working memory.

Neuroscientists use magnetic resonance imaging (MRI), a noninvasive and safe procedure to provide them with actual pictures of brain structure and how it works. Neuroscientists have discovered rapid periods of cognitive growth that correspond to periods of maturation of the brain's frontal lobes (Mahone & Silverman, 2008). When these brain systems do not develop as expected, behavioral consequences can manifest as ADHD (Powell & Voeller, 2004).

Neuroimaging methods have shown increased neuronal firing in the prefrontal and posterior parietal lobes, and the thalamus and anterior cingulate when someone is working hard to pay attention (Jensen, 2005). Brain delay in ADHD children is most pronounced in brain regions involved in thinking, paying attention, and planning. More recent studies found that the cortex in students with ADHD shows delayed maturation overall and an abnormal growth pattern between the two halves of the brain (Baumeister,

Henderson, Pow, & Advokat, 2012). These delays and abnormalities may be part of the reason for the symptoms of ADHD and help to explain how the disorder may develop.

Although the cause for ADHD is unknown, the genetic nature suggests a neurobiological explanation (Carbone, 2001). A good deal of recent research on ADHD has shown that it is associated with executive control difficulties. Executive function refers to group processes that allow individuals to pick the best strategy needed to 'get the job done.' These methods are based on all the knowledge and skills a person has acquired and the ability to implement these strategies effectively (Mahone & Silverman, 2008). Bakhshayesh, Hansch, Wyschkon, Rexai, & Esser (2011) found that in the resting awake state, usually with eyes closed, increased slow-wave activity may indicate ADHD. The slow-wave activity found in the central and frontal regions shows cortical underarousal. The second pattern of excessive beta activity or hyperarousal over frontal regions of the brain has also been found in patients with ADHD.

Neuroscientist John Ratey (2008), from Harvard Medical School, calls ADHD an attention variability disorder, sometimes accompanied by a component of having trouble remaining still or being impulsive. He points out that ADD is a genuine neurological condition based on dopamine and norepinephrine channels in the brain. These chemicals have specific functions in the arousal and attention centers of the brain. An imbalance in the chemicals leads to problems in arousal, which is what keeps us concentrating on something. The brain can be easily distracted if the attention center is not stimulated sufficiently.

According to Voeller (2004), new technologies have been developed to make it possible to examine brain function in adults and children while they are learning,

thinking, and behaving. The brain circuits involved in reading, language, social behaviors, and self-regulation are components of our neural system. Dysfunction in one part of the brain circuit system can lead to dysfunction in other parts (Voeller, 2004). Young children who show signs of atypical language development often have learning disabilities, that seem to occur in combination with social-emotional and behavioral problems. Often children with these problems also exhibit symptoms of ADHD. Having a better understanding of how ADHD affects the brain will help inform educators how to use brain-based learning strategies for their students.

ADHD students will sometimes engage in excessive physical movement to generate stimulation and reach homeostasis. Homeostasis is the property of a system in which variables are regulated so that internal conditions remain stable and relatively constant. It is a process that maintains the stability of the human body's internal environment in response to changes in external conditions. Adding environmental stimulation has been found to reduce the excessive movement of students with ADHD (Kercood, Grskovic, Lee, & Emmert, 2007). They found that external stimulation results in more normal levels of body movement in these students.

According to Mulrine, Prater, & Jenkins (2008), all students, especially those with ADHD, need exercise. They explain that exercise assists them with concentration and provides an outlet for normal impulse discharge, helping to control impulsivity. When kids exercise, their brain releases chemicals called neurotransmitters. Neurotransmitters include dopamine, which is directly correlated with attention. The stimulant medicines used to treat ADHD work by increasing the amount of this chemical in the brain.

Many teachers remain focused on verbal/linguistic and logical/mathematical intelligences and cater to the auditory and visual learners, using inadequate methods to teach many children (Skoning, 2008). Students with special needs often do not have strengths in these areas. Students with learning disabilities or ADHD are often identified as such because of their difficulty with linguistic and mathematical tasks. Skoning (2008) suggested the use of visual-motor and kinesthetic approaches to teach and encourage the creative development of children with cognitive disabilities. Since students with disabilities tend to have abilities that tend to be more creative, they understand the larger picture and more abstract concepts but struggle to memorize simple facts. Musical, visual, or kinesthetic intelligences are stronger skills for these students. Skoning (2008) revealed that integrating dance in math classes significantly increased positive attitudes toward math in students second through fifth grades. Student behavior and increased knowledge about a topic also improved when dance experiences were added to the curriculum. Many students who exhibit behaviors that challenge their teachers may be kinesthetic learners. These students have difficulty staying in their seats, facing the front of the classroom, and often need to fidget or move during the lesson. Incorporating dance can be beneficial for the students who have difficulty expressing themselves orally or in writing. These students are allowed the opportunity to express their understanding of concepts in various ways. It creates alternate forms of assessment that can be useful in evaluating the expression of a student's understanding of the class content.

Conclusion

This literature review examined how the human brain learns, three applicable theories that rely on students and student learning, different types of attention deficit

disorders, and the challenges faced by students with this disorder. Academic challenges were discussed as well as social, emotional, and behavioral challenges. The literature reveals that changes must occur in the classroom for students with attention issues to be successful academically. Research has shown that using kinesthetic-tactile learning methods in the curriculum gives students the learning opportunities to focus their attention on instruction rather than the unnecessary distractions in a classroom.

CHAPTER III

METHODOLOGY

The purpose of this study was to determine if there was a relationship between teacher beliefs about the use of movement for students with and without ADHD and both their current use of movement and intent to use movement in the classroom. The research questions are: (1) what was the relationship between teacher beliefs about movement and their intent to use it in the classroom, (2) what was the relationship between teacher beliefs about movement and their current use of it in the classroom, and (3) are teacher beliefs about using movement in the classroom related to teacher demographics?

The reported effect of movement on student academics, student behavior, and the importance of using movement were all factors examined when looking at teacher beliefs. The researcher also looked at teacher demographics (educational level, years of experience, gender, race, age, grade, and subject currently teaching) to see if these were related to teacher beliefs about movement.

In this study, research was conducted in two school districts in Mississippi. Active public-school teachers in Rankin County and Simpson County were invited to participate in the study, and surveys were disseminated during the spring semester of the 2018-2019 school year.

Research Design

This study was a quantitative, exploratory, correlational design that utilized survey methodology through a researcher-developed questionnaire survey. The setting was Rankin and Simpson counties in Mississippi. Variables in this study were the teachers' reported current use of movement in the classroom and intent to use it as well as

the reported effect of movement on student academics, student behavior, and teacher belief of using movement.

Participants

The study targeted teachers in public schools throughout Simpson and Rankin County as participants for the research. School districts were selected by convenience sampling based on their location being accessible in regard to the researcher's current location. A list of every teacher, along with his or her email address, was requested from the superintendent's office of each county. There are approximately 1,500 teachers in public schools in these two counties. According to the latest state accountability rating information, one district is rated an A district, and one is rated as a D.

Instruments

A pilot study was conducted to analyze the reliability of the instrument used in this study. Cronbach's alpha was computed for each section of the instrument producing a composite score. A link to a pilot study, along with an explanation of the intent of the study was sent out to a random sampling of approximately 30 teachers.

The researcher created the questionnaire, *Teacher Beliefs of the Intent and Use of Movement in the Classroom* (Appendix A), to measure participants' beliefs about their current use of movement in the classroom and their intent to use it in the classroom to increase reading and mathematics achievement for students with and without ADHD. As the scale was new, there was no reliability and validity established.

The Teacher Beliefs survey instrument contained two sections. Section I consisted of statements 1 through 7 and was designed to collect demographic information from the teacher responding to the survey. This information consisted of total years of teaching

experience, the subject and grade the respondent was currently teaching, the highest degree respondent had, and gender and race of respondent. In order to get a single score that measured teacher beliefs, questions 10, 12, 13, 14, 15, 19, 20, 21, 22, 23 and 26 were summed together and divided by 11. The mean score was analyzed by the demographic questions using linear regression statistical test to address research question three (RQ3).

Section II of the survey instrument consisted of 23 Likert scale questions ranging from 1-5 (i.e., 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree). This showed if an association existed between teacher beliefs and teacher intent to use movement in the classroom based on the respondent responses. This association answered research question 1 (RQ1). In this section, questions 10, 12, 13, 14, 15, 19, 20, 21, 22, 23 and 26 were summed together and divided by 11 in order to get a single mean score for the construct named teacher belief. There are 4 questions stated in the negative that were reverse coded in the construct that makes up teacher beliefs.

The six questions that measured the intent of teachers were numbers 17, 24, and 27-30. These six questions were summed together and then divided by 6 to get the mean for the teacher's intent to use movement. Linear regression was used as the statistical test.

To answer research question 2 (RQ2), similar procedures to address if there is a relationship between teacher beliefs and their intent to use in the classroom were used. The researcher used the mean score for teacher beliefs and compared it to the mean score of questions 8,9,11,16,18 and 25 that measured the teacher's current use of movement in the classroom. Question 25 was reverse coded because it was stated in the negative form for question 11. Linear regression was used to see if an association existed between teacher beliefs and their current use of movement.

Procedures

The Teacher Beliefs evaluation survey was created in electronic form so that it could be disseminated to the participating districts. A letter was drafted requesting the school superintendent's permission to survey teachers in their districts. An email containing the letter, a copy of the consent letter (Appendix D), and a copy of the survey instrument (Appendix A) were sent to two school districts in South Mississippi. Two superintendents responded, granting permission to conduct this study. After gaining approval from the Institutional Review Board (Appendix C), an email containing a link to the survey was sent to the participating superintendents or their designee to be forwarded in the manner they felt will be best for the teachers in their perspective districts. The survey was left open to accept responses for thirty days from the day the first email was sent. The data was transferred to an EXCEL data file with de-identified information about teachers' beliefs and their intent and current use of movement. The digital spreadsheet also included demographic information about teachers.

Before beginning the pilot study, permission from The University of Southern Mississippi Institutional Review Board (IRB) was granted (Appendix C). A permission letter was sent to the superintendent of Rankin county to gain permission to administer the questionnaire to the teachers in the school district. Once permission was granted (Appendix B), the survey was sent to 30 teachers at an elementary school in Rankin County School District through email. The teachers were chosen based on the researchers' knowledge of what they knew about movement and students with ADHD and the possibility of them returning the questionnaire. Teachers were encouraged to

make comments and suggestions on the survey before returning it to the researcher. Participants in the pilot program were not included in the current study.

After the pilot study was conducted and the instrument was improved, an email was sent out by the two superintendents who gave permission that explained who the researcher was, the affiliated university, the purpose of the questionnaire, and that the questionnaire was completely voluntary according to the International Review Board (IRB) participation guidelines (Appendix C). The superintendents' email to all teachers in the school district contained the link to Qualtrics, an Internet survey site. This site allowed the participants to complete the survey anonymously to ensure confidentiality and accuracy.

Data Analysis

SPSS statistical software was used, allowing the researcher to create a data file from the completed instruments. Descriptive statistics were calculated to determine the rating of each item on the survey (frequencies, means, and standard deviations). Linear regression statistical test was used to examine whether an association existed between teacher beliefs and their intent to use movement (RQ1) in the classroom. The same test was used to determine if an association existed between teacher beliefs and their current use of movement (RQ2) and to examine whether teacher beliefs about movement were associated with teacher demographics (RQ3). Linear regression was an appropriate test to answer this question because the researcher could examine a set of predictor variables to predict an outcome variable. The linear regression analysis helped the researcher predict whether teacher beliefs impacted their use of movement and intent to use movement in

the classroom. Linear regression tests assume a linear relationship, multivariate normality, little or no multicollinearity, no auto-correlation, and homoscedasticity.

CHAPTER IV

ANALYSIS OF DATA

Introduction

The study utilized a quantitative approach to identify the association between teacher beliefs of utilizing movement in the classroom and their intent and current use of movement. The study also examined any association between teacher beliefs and the demographic information obtained. The instrument used in the study was *Teacher Beliefs of the Intent and Use of Movement in the Classroom* (Appendix A). Data were collected through the use of survey methodology with a questionnaire compiled of perceived beliefs of utilizing movement in the classroom with certified educators in the state of MS.

The questionnaire, *Teacher Beliefs of the Intent and Use of Movement in the Classroom* (Appendix A), was distributed to certified elementary teachers in two counties located in Southern Mississippi. The questionnaire was distributed to over 1500 teachers, and a total of 379 were completed and returned to the researcher.

Demographics

Demographic data about the 379 certified educators in the study reflected that the sample included 350 (92%) females and 29 (7.7%) males. Of these 379 participants, 351 (92.6%) were Caucasian, and 29 (7.7%) were African American. According to the questionnaire, teaching experience ranged from 0 years to 20 plus years. Fifty-seven (15%) of the respondents had 0 to 3 years teaching experience, 69 (18.2%) had 4 to 7 years, 65 (17.2%) had 8 to 11 years, 40 (10.6%) had 12 to 15 years, 56 (14.8%) had 16 to 19 years, and 90 (23.7%) had twenty plus years of teaching experience.

Table 1 shows the education level of the respondents ranged from a bachelor's degree to a doctorate degree. One hundred fifty-nine (42%) respondents held a bachelor's degree, 192 (50.7%) held a master's degree, 22 (5.8%) held a specialist degree, and 6 (1.6%) held a doctorate. The ranges of ages spanned from 18 to 60 plus years (Table 2). There were 23 (6.1%) participants that ranged in age from 18 to 23 years old, 52 (13.7%) that ranged from 24 to 29 years old, 70 (18.5%) that ranged from 30 to 35 years old, 74 (19.5%) that ranged from 36 to 41 years old, 76 (20.1%) participants that ranged from 42 to 47 years old, 52 (13.7%) ranged from 48 to 53 years old, 17 (4.5%) that ranged from 54 to 59 years old, and 15 (4%) that were 60 or more years old.

Table 1
Academic Rank of Participants

		Frequency	Percent
Valid	Bachelors	159	42
	Masters	192	50.7
	Specialist	22	5.8
	Doctorate	6	1.6
	Total	379	100

Table 2
Participant Ages

	Age	Frequency	Percent
Valid	18-23	23	6.1
	24-29	52	13.7
	30-35	70	18.5
	36-41	74	19.5
	42-47	76	20.1
	48-53	52	13.7
	54-59	17	4.5
	60 or above	15	4
	Total	379	100

Also, some of the respondents taught varying and/or multiple subjects. Therefore, the number of classes reported differs from the number of respondents. These subjects included mathematics, language arts, science, social studies, and others. Mathematics classes were taught by 173 (62.3%) of the respondents, language arts classes were taught by 172 (37.5%) of the respondents, science classes were taught by 123 (26.8%) of the respondents, social studies classes were taught by 117 (25.5%) of the respondents, and 160 (34.9%) of the respondents reported teaching classes labeled as other.

Instrumentation

The questionnaire, *Teacher Beliefs of the Intent and Use of Movement in the Classroom* (Appendix A), was created by the researcher. The original questionnaire

contained 30 items. Of those items, 23 were Likert items with participants being able to respond by marking strongly disagree, disagree, neutral, agree, or strongly agree. Teacher Intent to use movement and Teacher Current use of movement was measured by these 23 items. The remaining 7 items asked demographic questions pertaining to the respondents.

In order to evaluate the instrument used, a pilot study was conducted with a group of 30 participants ranging from 1 to 27 years of teaching experience at a local school within Rankin County School District. Permission was obtained from the principal of the school (Appendix B) to conduct the pilot study. The purpose of the pilot study was to determine if the questionnaire was valid and reliable, along with determining if any direction or question was misleading or was unclear. The pilot study participants were asked to read everything thoroughly and to make a note of any concerns they had in regard to spelling, clarity, wording, or any other issue they had with understanding the questionnaire.

The completed pilot study questionnaire consisted of 30 items. Seven of these items collected demographic data from the respondents and 23 items collected data (using a five-point Likert scale ranging from strongly disagree to strongly agree) measuring teachers' current use of movement in the classroom, their intent to use it in the classroom, and their personal beliefs that movement increases reading and mathematics learning for students with and without ADHD.

The data collected from the pilot study were entered into SPSS to determine the reliability of the questionnaire, *Teacher Beliefs of the Intent and Use of Movement in the Classroom* (Appendix A). The first analysis output from the pilot study for Cronbach's alpha was .754 on 26 items, showing that reliability or internal consistency was adequate.

Three constructs were developed by the researcher measuring teacher beliefs about utilizing movement in the classroom, teachers' intent to utilize movement in the classroom, and lastly, teachers' current use of movement in the classroom (Table 3). Since the items were measuring different constructs, the researcher looked for appropriate ways to reduce the number of items while maintaining reliability. The researcher then ran analyses on different items in each construct. The Cronbach alpha for teacher belief about using movement was .716. The remaining items on the questionnaire were then divided into two constructs. The construct that measured teacher intent to utilize movement in the classroom measured at .579. Once the researcher removed item #24 (In a typical week, how much time would you ideally like to incorporate movement in the classroom) from the teacher intent to use movement in the classroom construct, the Cronbach alpha rose to .675. The final construct measuring teachers' current use of movement in the classroom showed a Cronbach alpha of .743.

Table 3
Cronbach Alpha

Factor Name	Items	Cronbach Alpha	Mean	SD	N
Teacher Belief (TB1)	10,12,13,14,15,19,20,21,22,23,26	.716	3.50	.286	374
Teacher Intent (TI1)	17,27,28,29,30	.675	3.33	.373	374
Teacher current use (TCU1)	8,9,11,16,18,25	.743	3.13	.415	374

The final questionnaire, which consisted of 29 items, collected data (using a five-point Likert scale ranging from strongly disagree to strongly agree) measuring three

different constructs associated with teacher beliefs about utilizing movement in the classroom, teacher intent to use movement and teachers' current use of movement in the classroom. Item 27 (Lecture-style instruction is more effective than using movement as a way to instruct students) had the highest mean (10.47). The lowest mean (1.58) was Item 8 (What is your personal physical activity level). Table 4 reflects the means and the standard deviations in descending order from the respondents.

Table 4
Means and Standard Deviations

Item #	N	Mean	SD
27	374	10.47	1.582
30	376	8.71	1.342
29	376	8.53	1.298
28	374	7.42	1.381
20	378	4.31	.621
22	378	4.25	.798
15	380	4.23	.634
10	380	4.23	.757
21	379	4.17	.579
23	379	4.09	.604
17	378	4.07	.640
25	376	4.07	.782
18	380	4.04	.630
26	374	4.00	.909
19	379	3.98	.880
12	379	3.93	.81
11	380	3.90	.770
16	380	3.81	.847
13	379	3.68	.725
9	379	3.51	.898
14	380	1.97	.745
8	379	1.58	.640

Statistics

Hypothesis 1: There is a relationship between teacher beliefs about utilizing movement in the classroom to increase reading and mathematics achievement and the teachers' intent to use movement.

Hypothesis 2: There is a relationship between teacher beliefs about utilizing movement in the classroom to increase reading and mathematics achievement and the teachers' current use of movement.

Hypothesis 3: There is a relationship between teacher beliefs about utilizing movement in the classroom to increase reading and mathematics achievement and the reported teacher demographic information.

Multiple regression was conducted to determine if an association exists between the teacher beliefs about utilizing movement in the classroom, their intent to use it to increase reading and mathematics learning for students with and without ADHD, and their current use of it in the classroom (Table 5). The dependent variable was Teacher Beliefs of Utilizing Movement. The independent variables included Teacher Intent to Utilize Movement, Teacher Current Use of Movement, gender and age, ethnicity, highest degree earned, years taught, subject(s) taught, and personal physical activity level. The alpha was set at .05. As shown in Table 4, the combination of the nine perceived attributes was significantly related to teacher beliefs about utilizing movement in the classroom to increase mathematics and reading instruction for students with and without Attention Deficit Disorder $F (12, 361) = 16.832$, $p < .001$. The multiple correlation coefficient was .370, indicating that approximately 37% of the variance in teachers'

beliefs about utilizing movement can be accounted for by the linear combination of the nine perceived attributes.

Table 5 showed that the attribute teachers' current use of movement ($p < .001$) was a statistically significant predictor at the .05 level in this model. Grade level was also a statistically significant predictor in this model ($p = .014$). Personal activity level of the teachers was a statistically significant predictor for teacher beliefs about utilizing movement ($p = .001$). The remaining six variables, teacher intent to utilize movement, gender, age, highest degree earned, years teaching experience, and subject currently teaching, appeared not to influence teachers' beliefs of utilizing movement in the classroom to increase mathematics and reading achievement. The b weight for teachers' current use of movement was .417, which meant that as this variable increased one unit, the teachers' belief of using movement increased by .417 when holding the other variables constant. The b weight for grade level was -.029, which meant that as this variable increased one unit, the teachers' belief about using movement decreased by .029 when holding the remaining variables constant. Finally, the b weight for teachers' personal physical activity level was -.074, which meant that as this variable increased one unit, the teachers' belief of using movement decreased by .074.

Table 5
Coefficients

Predictor	B	SE B	β	P value
TCU1	.417	.036	.605	<.001
TI1	-.059	.034	-.077	.080
Gender	-.036	.050	-.034	.466
Ethnicity				
African American	-.066	.049	-.061	.173
Age	-.009	.009	-.063	.314
Highest Degree	.005	.020	.001	.804
Years Teaching	-.007	.008	-.053	.405
Grade teaching	-.029	.012	-.137	.014
Subject				
Science	.027	.037	.044	.464
Social Studies	-.029	.037	-.046	.434
Other	.052	.030	.088	.083
Personal Activity Level	-.074	.022	-.166	.001

Dependent Variable= TB1Note. B = unstandardized beta; SE B = standard error; β = beta; P value < .05

CHAPTER V

DISCUSSION

Introduction

This research study intended to determine if there was a relationship between teacher beliefs of utilizing movement in the classroom and their intent and current use of movement. The study also examined any association between teacher beliefs and the demographic information obtained. This chapter begins with a summary of the results that were analyzed in chapter four. Limitations of the study have been identified and will be discussed. Next, recommendations for school leaders are outlined to aid practitioners in utilizing the research to support the use of movement in the classroom. Recommendations for future research are outlined next to assist those who wish to continue this research avoid particular obstacles or even to expand the research appropriately. Last, a summary concludes the chapter.

Summary of the Results

Survey methodology was used, and the instrument, *Teacher Beliefs of the Intent and Use of Movement in the Classroom* (Appendix A), was sent to two public school districts in southeastern Mississippi. This questionnaire included 29 total items made up of 11 Likert items which collected perceived beliefs of utilizing movement in the classroom from teachers, 5 Likert items which collected perceived teacher intent to use movement in the classroom, 6 Likert items which collected teachers' current use of movement in the classroom, and 7 items which collected demographic data. Participants were asked to respond using the scale strongly disagree, disagree, neutral, agree, or strongly agree.

Surveys were sent to over 1000 teachers in two local school districts, with 379 participants completing the questionnaire.

Through an analysis of the responses from 379 certified teachers, conclusions from the study were obtained. First, demographic data of the respondents regarding the personal factors of age, level of education, highest degree earned, sex, race, personal activity level, and years of teaching experience were collected. Regarding personal factors, the majority of teachers surveyed fell mostly in the 42-47 age range, were Caucasian, and had a personal activity level of exercising 0-2 days a week. Regarding professional factors, the majority surveyed had a master's degree with at least 20 years of teaching experience, currently teaching reading at the high school level.

With demographic data reported, and the perceived teacher beliefs about utilizing movement in the classroom and their intent and current use of movement quantified, the hypotheses of the research were addressed.

Hypothesis 1 suggested that there was a significant relationship between teacher beliefs of utilizing movement in the classroom and the teachers' intent to use movement. The results of the research revealed were not statistically significant. According to this research, there was not a statistically significant relationship between teachers' beliefs and their future intent to use movement for increased academic achievement of students with and without ADHD. These finding do not support the literature that says

Hypothesis 2 suggested that there was a statistically significant relationship between teacher beliefs of utilizing movement in the classroom and the teachers' current use of movement. The results of the research revealed a statistically significant association. The current use of movement in the classroom proved to have a significant positive impact on teacher beliefs. According to the research, the more teachers presently utilized movement to increase achievement in reading and mathematics in the classroom, the more they believed it would indeed increase achievement in these areas. This supports the claim that the more we move, the more interconnections we make with our brain, creating integrative and energetic thinking. People learn by moving, waking up the other systems of the body when you move (Hannaford, 192).

Stalvey and Brasell (2006) found that providing students with an appropriate method of coping with fidgety and impulsive behavior reinforces on task behavior and also teaches students more appropriate behaviors to replace the inappropriate ones. The study done by Stalvey and Brasell supports the findings that movement helps students with ADHD focus and learn. They also found that movement helped the students calm down and concentrate.

Kercood (2007) also conducted a study to assess motor activity during academic tasks. Results from the study showed that students performed better with movement with tactile stimulation answering more questions correctly. Kercood's research aligns supports the findings that there is a positive association between teachers' perceived beliefs about utilizing movement in the classroom and their current utilization of it for student academic achievement.

Also supporting these findings is a study done by Mulrine, Prater, & Jenkins (2008). They determined that all students need exercise and explained that exercise assists students with concentration providing an outlet for normal impulse discharge.

Hypothesis 3 suggested that there is a relationship between teacher beliefs about utilizing movement in the classroom for academic achievement and the reported teacher demographic information. The results of the research revealed two significant associations between the perceived teacher beliefs and the influence of the aforementioned personal and professional factors.

Grade level was a statistically significant predictor in this model. As this variable increased one unit, the teachers' belief in using movement decreased when holding the remaining variables constant. Studies with the Teele Inventory for Multiple Intelligences revealed information that could affect the way teachers provide information at different grade levels (Teele, 1996; Ozdemir, Guneysu, & Tekkaya, 2006). The inventory found that primary students' most dominant intelligences were spatial, bodily-kinesthetic, linguistic, and logical-mathematical. Upper elementary students tended to be more spatial, body-kinesthetic, interpersonal, and musical. Jodi Peebles (2007) found fluency strategies in her reading programs that involved movement in grades two through six in both regular and special needs literacy classrooms. This repetition helped build both fluency and comprehension. Teachers are aware of what strategies are consistent with student achievement and utilize them when they can. This supports the findings that grade level does have a statistically significant association with teachers' beliefs about utilizing movement in the classroom.

The weekly personal activity level of respondents also had a statistically significant association with the perceived teacher beliefs. As this variable increased one unit, the teachers' belief in using movement decreased. This does not support what was found in the literature review. Teachers use kinesthetic learning to stimulate their personal learning as well as helping children to find and develop their resources, not to bombard them with information and skills. The teacher should be the motivator and explicitly model with his/her methods designed to encourage children to be active in their learning (Walter, 2009). Glassman (2001) emphasized human inquiry in life and determined what goals are important to them. Establishing more use of the body in everyday activities provides many advantages, including more ownership, experimentation, and innovation.

Limitations

Several limitations have been identified through the research process that could have impacted the study. First, the research study was limited to responses from 379 certified teachers in two school districts in Mississippi. Reliability could be strengthened by expanding this study to include more certified teachers in Mississippi and even including additional states to the research. Next, the researcher's decision to include only a select few personal and professional factors to assess teachers' beliefs in using movement in the classroom was a limitation. While there are too many personal and professional factors to include in all research studies, more factors could have been incorporated to further strengthen the research by gaining more of an understanding of what factors promote or deter teacher beliefs when it comes to utilizing movement to increase reading and mathematics achievement in students. Last, the varying degrees of socioeconomic status between districts and schools of the teachers surveyed was a limitation. For this

study, all teachers contributing to the study were only aggregated as a whole to gain an overall teacher belief perception of using movement in the classroom for the academic achievement of the students. The socioeconomic differences in the environments of the teachers surveyed could have had an impact on the perceptions of their beliefs to utilize movement.

Recommendations for Policy

This research is intended to provide certified classroom teachers and school administrators with insight as it pertains to using movement in the classroom to increase the academic achievement of all students, including students with ADHD.

Leadership is often regarded as the single and most important factor of the success or failure in the organization (Hoy & Miskel, 2010). School principals are primarily responsible for the successful management of the school and the efficiency of education and training (Ogawa et al., 2002; Finn 2003; Hess 2003; Hoy and Miskel 2010). At this point, educational institutions and the managers of these institutions, namely school principals, need to perform critical tasks for the training and development of desired individuals (Sahin 2003). With only a limited amount of research currently available regarding the topic, the results obtained from this study highlight factors that influence teacher beliefs of using movement in their classrooms to help students achieve academically in reading and math.

School districts and school administrators, understanding now what impact movement can have on students' academic achievement, can offer relevant, creative opportunities and incentives to classroom teachers. Understanding that a teacher's belief about using movement in the classroom is associated with them currently using it and

intending to use it in the future, school principals can offer professional development that would help teachers strengthen their understanding of the positive influence movement can have on students.

Teachers and principals are key actors in implementing reform programs successfully. Research has shown that teachers' past experiences and beliefs in their own expertise may lead to their resistance for change (Jennings, 2012 & Yoou, 2016). Teacher buy-in has been widely believed to be on the of the key factors that lead to successful and sustainable policy implementation.

Principals' data use has become a critical component of leadership tasks in schools. Principals' data-driven leadership ay lead to the implementation of more concrete practices associated with both teachers' instructional improvement and organizational structure (Jennings, 2012). School leaders' data use may motivate teachers to change their practices and encourage them to participate in professional development.

Recommendations for Future Research

Due to the research including only two public school districts in the state of Mississippi, a small sample size proved to be a limitation. Future research should include a larger sample size that not only includes a few school districts in the state but possibly throughout the state of Mississippi, as well as neighboring states and beyond. While public school teachers offer valuable information regarding their perceptions of utilizing movement in the classroom, including the perceptions of school and district administrators from not only the state of Mississippi but neighboring states as well could prove beneficial.

Increasing the sample size, along with adding other personal and professional factors, could also allow for flexibility in this research. Comparisons could be made

between elementary, middle, and high school teachers and administrators to see if perceptions of utilizing movement are different amongst these groups. Increasing the range of those being surveyed by including public school teachers from other states would allow for comparisons of their beliefs geographically by states. Additional information about individual students in the classroom could also further strengthen the research by offering a more thorough examination of students' preparedness for academic achievement. Knowing if a student has been diagnosed with any social, emotional, or academic issues would provide more in-depth information on what works best to help these students reach their academic potential.

This study could be modified to make comparisons based on students diagnosed with and without ADHD as well. Due to the accessibility of this student data, the perceptions of teachers and their current use and intent to use movement were examined. The results of such a study where comparisons are made between students with and without ADHD could provide valuable information for teachers and administrators. This sort of information could change how teachers deliver the instruction in their classroom as well as how students perform academically.

Summary

Chapter V provides a summary of the results from the research that included a compilation of demographic data of personal and professional factors of teachers, perceived teacher beliefs about their current use, and future intention to utilize movement to push their students academically. Several limitations were found through the implementation of the study and discussed as a means of prevention in future studies.

Multiple recommendations were made from the results of the research that can aid educational policy and practice, as well as any research attempted on this topic in the future.

In closing, this researcher hopes to provide clarity for those wishing to assess if having students move in the classroom impacts their academic achievement. According to Caine and Caine (2000), all students can comprehend more effectively when their needs for social interaction are fulfilled, when they are involved in engaging experiences that utilize all of the senses and body, and when their attention is deepened by interest, emotion, and meaning.

When teachers understand the benefits of the instructional decisions they make, they are then empowered to share their beliefs with others, creating the opportunity for a more successful learning environment.

APPENDIX A – QUESTIONNAIRE

Teacher Beliefs of the Intent and Use of Movement in the Classroom

1. What is your gender?

    1. Male
    2. Female

2. How do you racially/ethnically identify?

    1. Caucasian
    2. African American
    3. Hispanic
    4. Asian
    5. Other

3. What is your age?

    1. 18-23
    2. 24-29
    3. 30-35
    4. 36-41
    5. 42-47
    6. 48-53
    7. 54-59
    8. 60+

4. What is your highest degree earned?

    1. Bachelors
    2. Masters
    3. Specialist
    4. Doctorate

5. How many years have you taught?

1. 0-3
2. 4-7
3. 8-11
4. 12-15
5. 16-19
6. 20+

6. What grade do you currently teach?

1. K
2. 1st-3rd
3. 4th-5th
4. 6th-8th
5. 9th-12th

7. What subjects do you currently teach? Circle all that apply.

1. Mathematics
2. Reading/Language Arts
3. Science
4. Social Studies
5. Other

8. What is your personal physical activity level? (30 mins/day)

1. 0-2 days/week
2. 3-5 days/week
3. 6-7 days/week

9. How often do you incorporate movement in your classroom?

1. Never
2. Rarely
3. Occasionally
4. A moderate amount
5. A great deal

10. It is important to integrate movement in the classroom.

    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree

11. I use movement in the classroom increases students' academic achievement.

    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree

12. Student behavior improves when movement is incorporated in the classroom.

    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree

13. Student test scores improve when movement is incorporated in the classroom.

    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree

14. Movement in the classroom has no effect on student behavior.

    1. Strongly disagree
    2. Disagree
    3. Neutral
    4. Agree
    5. Strongly Agree

15. Students are in a better mood when movement is incorporated in the classroom.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

16. I use movement in the classroom to help students remember and learn the material presented.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

17. I intend to use movement with Students with Attention Deficit Disorder (ADD) or Attention Deficit with Hyperactivity Disorder (ADHD).

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

18. I use movement in the classroom with students with ADD/ADHD as an effective intervention for this disability.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

19. Kinesthetic and tactile learning experiences produce more positive achievement gains with students with ADD/ADHD.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

20. Matching students' learning styles with the appropriate instructional strategies improves the student's ability to concentrate and learn.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

21. Movement assists students with ADD/ADHD with concentration and provides an outlet for healthy impulse discharge, helping to control impulsivity.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

22. Movement is not important to use in the classroom.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

23. Kinesthetic and tactile learning experiences do not produce more positive achievement gains with students with ADD/ADHD.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

24. In a typical week, how much time would you ideally like to incorporate movement in the classroom?

1. Never
2. Rarely
3. Occasionally
4. A moderate amount
5. A great deal

25. Integrating movement in the classroom has no effect on academic achievement.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

26. Accommodating individual learning styles is not time effective and feasible in the classroom.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

27. Lecture-style instruction is more effective than using movement as a way to instruct students.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

28. Auditory and visual learning is a better way for students to learn material presented than using movement.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

29. Memorizing information is a better way for most students to learn than using movement in the classroom.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

30. Students with ADHD need strict discipline and movement does very little in order for learning to occur.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

APPENDIX B – SUPERINTENDENT APPROVAL

May 6, 2019

The purpose of this correspondence is to document that I have given permission for Kimberly McQuagge to conduct a research project which will add to the knowledge base what is known about utilizing movement in the classroom as it influences reading and mathematics achievement for students with and without ADHD. She intends to achieve this goal by examining teacher perspectives of using kinesthetic and tactile movement in the classroom and the perceived effects on academic achievement. I understand that conducting this research is subject to approval by the USM IRB.

Sue Townsend
Superintendent Signature

6/12/19
Date

Simpson County School District

111 Education Lane
Mendenhall, MS 39114

(601)847-8000 Office

(601) 847-8003 Fax

February 10, 2019

The purpose of this correspondence is to document that I have given permission for Kimberly McQuagge to conduct a research project which will add to the knowledge base what is known about utilizing movement in the classroom as it influences reading and mathematics achievement for students with ADHD. She intends to achieve this goal by examining teacher perspectives of using kinesthetic and tactile movement in the classroom with students with ADHD and the perceived effects on academic achievement at this facility. I understand that conducting this research is subject to approval by the USM IRB.

Greg Paes

Superintendent Signature

2-11-19

Date

Achieving Excellence In Education

Greg Paes, Superintendent

APPENDIX C – IRB APPROVAL LETTER

Date: 3-1-2020

IRB #: IRB-19-346
Title: Teacher Beliefs About Utilizing Movement in the Classroom
Creation Date: 7-15-2019
End Date:
Status: Approved
Principal Investigator: Kimberly McQuagge
Review Board: Sacco (Exempt/Expedited Board)
Sponsor:

Study History

Submission Type	Review Type	Decision
Initial	Exempt	Exempt

Key Study Contacts

Member Kimberly McQuagge	Role Primary Contact	Contact kimberly.mcquagge@usm.edu
Member David Lee	Role Co-Principal Investigator	Contact david.e.lee@usm.edu
Member Kimberly McQuagge	Role Principal Investigator	Contact kimberly.mcquagge@usm.edu

APPENDIX D – PARTICIPANT CONSENT LETTER

Dear Potential Participant,

I would like to ask you to consider participating in a study because you are a certified Educator in the state of Mississippi. The purpose of this study is to add to the knowledge base regarding what is known about utilizing movement in the classroom as it influences reading and mathematics achievement for students with and without ADHD. I intend to achieve this goal by examining teacher perspectives of using movement in the classroom with students and the perceived effects on academic achievement.

If you choose to participate in this study, and are at least 18 years of age, you will be asked to complete a short questionnaire. The questionnaire will gauge teacher opinions about using movement in the classroom and its contributions to academic achievement among students. The questionnaire should take less than 15 minutes to complete. Participation in this study is completely voluntary and participation may be discontinued at any time without penalty or prejudice. There are no risks involved with participation in this study. All data collection will remain completely anonymous. Any identifying information inadvertently obtained during the course of this study will remain completely confidential. Upon completion of the study, all questionnaire data will be destroyed. As one of the requirements for dissertation, the data will be used for the completion of a research study. Additionally, the findings from this study will be used in publications and may be used in district presentations regarding the use of structured movement in the classroom.

If you have questions concerning this research, please contact Kimberly McQuagge at Kimberly.Mcquagge@usm.edu. This research is being conducted under the supervision of David Lee, Ed.D.

This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-6820. By completing and returning the attached questionnaire, the respondent gives permission for this anonymous and confidential data to be used for the purposes described above.

Thank you for your consideration.

Kimberly McQuagge

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