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Sommerfeldt, Andrea M. ***A Pilot Study Concerning Student Perceptions of Brain Gym® in the Classroom***

Abstract

In education, movement is important in building physical, mental, communicative, cognitive and social skills needed to help students be successful learners (Dennison & Dennison, 2010). According to Hyatt (2007), movement is necessary for effective learning, as it promotes a positive image of self and ability. Brain Gym® is a kinesthetic program that teaches students specific activities that promote the use of movement to engage students in the learning environment, strengthen areas of weakness, and promote whole-brain learning (Dennison & Dennison, 2010). The present study examined the academic, emotional, and behavioral benefits of Brain Gym. Twenty students from a rural elementary classroom who participated in Brain Gym activities for 12 weeks were surveyed. Analysis of a pre and post survey as well as a weekly snapshot survey indicated some students believed Brain Gym had academic (e.g. grades) and behavioral (e.g. concentration) benefits and others did not. In terms of emotional benefits, the analysis indicated the program increased positive emotions while also decreasing negative emotions. Given the relationship between positive emotions and student engagement (Reschly et al., 2008) as well as the role of engagement in learning, implementing Brain Gym activities could potentially lead to improved learning outcomes for students.

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Chapter I: Introduction

From birth and throughout life, humans are constantly learning and absorbing information from their surroundings. Research tells us that higher organisms use their senses to learn (Classen, 1999). The brain develops connections from what individuals see, hear, taste, touch, and smell. Our eyes process light and send electrical signals to our brain, which then interprets images, allowing us to see the world around us. Our other sense organs, skin, nose, and ears, transform the temperature of water, the smell of food, the sound of voices into electrical data as well (Le Poncin, 1990). Individuals may have preferences as to which senses they tend to rely on most, depending on their respective environment as well as the condition of the physical self, they will adapt to the environment, making some senses stronger than others (Classen, 1999). When the senses are better developed, the human body is able to move and respond to sensory input.

As humans, we adapt to our environment so that we can learn, which, according to Felder and Brant (2005), is why some individuals learn better when watching someone else do something first, and why others read about how to do something and are then able to accomplish the task on their own. Ultimately, we rely on the combination of multiple senses to send one composite signal from our body to our brain (Le Poncin, 1990). For example, many individuals benefit from hands-on experiences to process information or learn a new skill (Felder & Brent, 2005). As we grow, we observe, listen, or otherwise experience what is necessary in order to succeed and survive. Individuals learn to move and be flexible; we depend on the connection between our brain and our bodies to keep us safe and to help us move forward, both physically and metaphorically.

There is a growing understanding of the connection between movement and learning.

Kinesiology, the science of movement, uses total body integration to improve the mental connections that are made when an individual learns a new skill (Hendy, 2000). Therefore, using one's body as a way to activate the brain allows an individual to interact and react appropriately. In education, there are many demands on students. They are expected to sit quietly and attentively at their desks, focus and listen, and participate in meaningful discussion (Rubie-Davies, Hattie, & Hamilton, 2006). However, not all students are able to sit quietly, listen attentively, or participate in a similar manner as is expected of their peers. Such students would benefit from learning strategies that can help them become more efficient learners. An education-based movement program known as Brain Gym has been developed to incorporate learning and movement to aid overall performance in school (Dennison & Dennison, 2010).

Brain Gym is considered a form of educational kinesiology (Hyatt, 2007), and was developed by educators Paul and Gail Dennison. An expert in the field (Cammisa, 1994) defined educational kinesiology as a form of treatment that uses specific movements to activate various parts of the brain which maximize learning potential. Brain Gym is a system of 26 movement activities that anyone can use to help prepare them to learn (Dennison & Dennison, 2010). The movements focus on kinesthetic exercises divided into three categories: midline movements for focus, energy exercises for laterality, and lengthening movements for centering, which create new pathways that increase an individual's ability to store and retrieve information (Radford, 2009).

Brain Gym exercises can serve a variety of purposes, both academically and behaviorally, especially within education. For example, students who struggle for reasons related to difficulty attending, participating, or completing daily work in a timely manner can benefit from these exercises. According to Dennison and Dennison (2010), Brain Gym activities are being used

internationally to help students succeed both in and out of the educational setting. Brain Gym approaches teaching these techniques through creating a better understanding of movement-based learning. Not only is movement critical for brain development and providing sensory input in infants and toddlers it is also beneficial for any learner. Movement provides sensorimotor learning, which offers optimal growth and development for adults as well as children (Dennison & Dennison, 2010).

Many movement therapies, such as Yoga, Tai-Chi, and Pilates focus on connecting one's breathing and movement to stimulate or regulate mental activity. Movement is natural and instinctual, though some individuals may benefit from training (Hendy, 2000). Brain Gym is similar in that the activities are meant to connect the brain and body to help it be productive as a whole. Organization, focus, and communication are the three skills sets that Brain Gym activities purport to enhance through the use of specific exercises, which are divided into four categories: Energy Exercises, Deepening Attitudes, Lengthening Activities, and Midline Movements (Dennison & Dennison, 2010). These exercises allow any individual to learn how to be productive with such tasks.

Organization is one of the most necessary skills in achieving success in any setting. In Brain Gym, organization involves two different types of exercises. The energy exercises involve up and down activities that center and align the body. These exercises help individuals develop planning skills (Dennison & Dennison, 2010). The deepening attitudes exercises involve focal pressure points and developing breathing patterns, which also fall within the organizational category, and allow individuals to calm, relax, and stabilize themselves emotionally (Dennison & Dennison, 2010). With the increased academic demands placed on children today, the ability to focus and attend has never been greater (Durrant, Cunningham, & Voelker, 1990). The focus

exercises emphasize forward and backward movements aimed to release build up tension, promote understanding, and encourage students to take initiative and express themselves comfortably (Dennison & Dennison, 2010).

Lastly, the communication exercises, which consist of left and right movements, enable a cross body coordination, thus allowing an individual to process information needed for "reading, writing, listening, and speaking" (Dennison & Dennison, 2010, p.6). Individuals engaging in this activity learn to cross the midline of their bodies in order to make connections between both hemispheres of the brain while focusing on breathing (Dennison & Dennison, 2010). By doing so, participants open themselves up to integrated learning, where all extremities such as eyes, ears, and hands work collaboratively (Dennison & Dennison, 2010). These exercises are the basis for Brain Gym; they focus on developing and enhancing functional performance in order to be a successful learner.

According to one physical therapist, more occupational and physical therapists are integrating Brain Gym activities into the services they provide for children (Rebecca Eller, personal communication, February 5th, 2014). There are also many teachers who use Brain Gym techniques within their classrooms. One elementary teacher indicated she found Brain Gym to be very helpful in gaining desired positive behavioral changes by increasing students' awareness of what their bodies need to self-soothe, calm down, provide appropriate energy, or increase the ability to attend within the classroom (Nadalie Kratcha, personal interview, November 7th, 2013). Dr. Mary McCabe (as cited in Hendy, 2000), an expert in the field of physical education, cites over 80 research studies that suggest movement helps students obtain academic readiness skills for learning. Motivation increases, understanding is heightened, and learning is accelerated, so it seems likely that movement-based therapies such as Brain Gym can be highly beneficial in any

classroom. However, little research has been conducted, and not much is known about how students perceive Brain Gym in the classroom.

Purpose of the Study

Research on educational kinesiology indicates movement activities improve brain connections, and therefore, learning (Dennison & Dennison, 2010; Hendy, 2000). According to Spaulding, Mostert, and Beam (2010), integrating both sides of the brain through movement purportedly decreases the level of psychological stress and optimizes learning potential. This suggests that school-based movement activities could facilitate student achievement. Brain Gym is designed to help students be emotionally, behaviorally, and academically successful within the educational environment. However, schools are expected to utilize evidence-based practices within education and there is a lack of research on Brain Gym. Thus, more data is needed in order to provide substantial support that Brain Gym is effective. The purpose of this study was to further investigate Brain Gym within the classroom environment. Specifically, the study examined student perception of Brain Gym exercises and their utility. The goal was to determine whether or not students felt academically, behaviorally, and emotionally prepared and successful in their educational setting after regular classroom participation in Brain Gym activities.

Research Questions

The following are questions to be answered throughout the research process:

1. Do students enjoy participating in Brain Gym activities?
2. Do students feel they are more prepared academically, behaviorally, and emotionally after participating in Brain Gym in the classroom?
3. Do student use Brain Gym exercises?
4. If so, which Brain Gym techniques do they use/ prefer?

5. How often do they use Brain Gym techniques?

6. Does Brain Gym have a positive effect on emotional state?

Definition of Terms

To facilitate learning, the following definitions are provided for clarification:

Alphabet 8s. An individual starts by doing lazy 8s and then incorporates drawing letters into the fluid motion of the lazy eight. This exercise allows a student to learn letters while "crossing the visual midline without confusion" (Dennison & Dennison, 2010, p. 36).

Arm activation. A student sits or stands with shoulder feet width apart. One hand is raised above the head, and the opposite hand is used to hold your arm against your ear. While focusing on breathing the student pushes on their extended arm on all sides roughly three or four times before switching. This activity has reportedly improved focus and concentration, postural alignment, hand-eye coordination, and increased energy. It is often used with students who struggle with spelling and creative writing activities (Dennison & Dennison, 2010).

Balance buttons. This activity requires a student to place two fingers behind the ear where the pulse can be felt, and the other hand over the navel, placing light pressure on both areas. This can be done standing, sitting, or lying down. The individual focuses on breathing, when ready switch hands and repeat. This is a useful exercise for individuals who struggle with organizational skills as it can enhance "comprehension, perception, and critical thinking and decision making abilities" (Dennison & Dennison, 2010, p. 60).

Belly breathing. Standing straight and tall, an individual places one hand over the belly button and focuses on taking short breaths in and out, slowly working up to taking deeper and slower breaths. The purpose of this exercise is to increase focus and attention, by helping one become centered and responsive to activities going on in his or her environment (Dennison &

Dennison, 2010).

Brain buttons. Make a "U" shape with one hand and place your thumb and fingers on the soft spots under your collarbones on either side of your sternum. Place your other hand over your belly button. Hold your lower hand still over your belly button while you make slow circular motions with your thumb and fingers up below your collarbone. After twenty seconds or more, switch hands and repeat. This is an energy exercise that relaxes neck and shoulder muscles to help a student receive feedback from where they are in space. (Dennison & Dennison, 2010).

Brain Gym®. "A group of quick, easy-to-do activities that help to instill specific movement patterns to reduce physical stress, allow for cognition, and help bring mastery of physical skills of learning (e.g., visual and auditory)" (Dennison and Dennison, 2010, p.119).

Calf pump. For this activity, students stand, place one leg forward bending the knee, and put both hands on their forward knee. Then, they lift their back foot up and down with their toes. This activity promotes relaxation, improved attention and focus, enhanced short-term memory, and the ability to follow through with tasks (Dennison & Dennison, 2010).

Centering. Integrating "emotional content and abstract thought; also physical organization" (Dennison and Dennison, 2010, p.119).

Cross crawl. Activity where a student stands, then takes their left arm and slowly raises their right knee to meet in the center. Then, they do the same with their right arm and left knee. This is a "movement whereby one side of the body moves in coordination with the other side, requiring bi-hemispheric (brain) activation" (Dennison and Dennison, 2010, p.120).

Cross crawl sit-ups. Cross Crawl sit-ups is similar to Cross Craw but it is performed while sitting down. An individual uses the core muscles of the stomach to connect the right elbow with the left knee, and then the left elbow with the right knee. An activation technique use

to promote alertness, which has been known to help students develop decoding and encoding reading skills as well as enhance listening comprehension and math computation (Dennison & Dennison, 2010).

Dennison laterality repatterning (DLR). A process that "achieves the neurological integration between the vestibular system, the gross-motor movements of the cerebellum, and the basal ganglia, as well as equal activation of the left and right hemispheres" of the brain (Basic Brain Gym Concepts, 1997, p.1).

Double doodle. When an individual has markers in both hands and draws mirror images, starting with large objects and going smaller as control and coordination is gained. It is **"**a bilateral drawing activity done in the midfield to establish directionality and special orientation" (Dennison & Dennison, 2010, p. 34).

Earth buttons. Place two fingertips under your chin and rest your other hand over your belly button, with your fingertips pointing down. With eyes closed focus on your breathing. After several deep breaths change hands and repeat. The purpose behind this activity is to "alleviate mental fatigue and promote alertness" (Dennison & Dennison, 2010, p. 58).

Educational kinesiology. The study of movement in relationship to whole-brain learning, which aims to understand stress alleviation and provide awareness of how movement can benefit learning (Dennison & Dennison, 2010, p. 120). It is also considered a specific treatment "using specific movements to access different parts of the brain in maximizing learning potential" (Cammisa, 1994, p.105).

Elephant. Similar to Lazy 8s, the Elephant is the same motion, but this time the student has one arm out with their head cocked so their arm can touch their cheek. Then, they use their arm to make the Lazy 8 symbol in the air. The purpose behind the Elephant is to increase

auditory attention and memory by integrating "visual, auditory, and kinesthetic" motions in one movement (Dennison & Dennison, 2010, p. 38).

Energizer. While sitting in a chair, a student places both hands flat on a table in front of them, has their feet spread shoulder width apart, and lowers their head down to the desk. While focusing on breathing, they lift their head up, straightening out the back and then slowly go back down. They do so as many times necessary, with the purpose of opening the diaphragm to energize the body, promote attention, and enhance listening comprehension (Dennison & Dennison, 2010).

Energy yawn. This activity requires students to pretend to yawn while placing finger tips along their jaw joints. This activity has been known to improve balance, circulation, and relax vision, promoting enhanced oral reading skills as well as creative writing and public speaking abilities (Dennison & Dennison, 2010).

Footflex. While sitting, a student will hold their leg out in-front of them, slightly bent at the knee. They will grab under their knee with the corresponding hand, and with the opposite hand they grab their ankle at either side of their Achilles tendon and apply pressure. Then, they move their toes toward and away from them until they feel their calf muscles relax, then they repeat with the other leg. This activity promotes relaxation with an emphasis on focus, which enhances planning and following directions, follow through, comprehension, and work completion (Dennison & Dennison, 2010).

Gravity glider. Students sit near the edge of a sturdy chair. They extend their legs out and cross them at the ankles. Then they reach forward with both arms and let gravity guide them downward. Focusing on breathing, they go up and down several times, cross their legs the opposite way, and repeat. This exercise is often used with students who struggle with visual

memory, abstract thinking, mental calculation, and reading comprehension. It provides increased energy, enhances vestibular balance, and increases self-expression (Dennison & Dennison, 2010).

Grounder. Students participate in the Grounder to enhance planning, organization, creativity, and self-expression. This activity correlates with better balance and coordination. It requires an individual to face forward with their feet about a leg length apart. After placing their hands on their hips, and pointing one foot forward, they turn sideways and bend at the knee. They slowly bend and go back to the standing position four or five times. Then switch legs and repeat (Dennison & Dennison, 2010).

Hook-ups. Part One: cross legs at the ankles. Extend both arms outward, thumbs pointing down, then cross both wrists, interlace the fingers, and bring both hands in and place them on the chest. Close your eyes and place the tip of the tongue to the roof of the mouth. Focus on breathing and remain in this position until you feel relaxed. Part two: Immediately after, uncross both legs and arms. Legs should be shoulder width apart, elbows are at the sides and the fingertips of both hands come together near the chest. Again, place the tip of the tongue to the roof of the mouth and focus on breathing. Once this activity is completed, most individuals feel centered, grounded, organized, and able to participate (Dennison & Dennison, 2010).

Lazy 8s. A movement where an individual holds their thumb out away from their face and draws an infinity symbol, or sideways eight in the air; this can also be done using a marker on a white board. The individual starts in the middle, goes up to the left, and traces the symbol over and over again, while focusing on their hand or the marker. The eyes follow the hand to stimulate focus and control (Dennison & Dennison, 2010).

Mindfulness. A process that one can apply to regulate attention and focus in order to

conjure awareness to current experience; mindfulness also enables the ability of "relating to one's experience within an orientation of curiosity, experiential openness, and acceptance" (Bishop, et al. 2004, p. 234). Other experts in the field (Smalley & Winston, 2010) would agree, and claim that mindfulness is a state of consciousness characterized by awareness of one's surroundings while keeping an open and curious mindset to fully attend to the here and now.

Neck rolls. Thrusting the chin forward and down, while keeping the head down and slowly moving your head from one shoulder to the next, relaxes neck muscles and releases tensions. This exercise is beneficial before parting in reading and writing exercises, as it enhances "binocular vision and binaural hearing" (Dennison & Dennison, 2010, p 40).

Owl. This activity stimulates visual, auditory, and head turning skills by lengthening muscles in the neck and shoulders, it restores range of motion and releases tension. The Owl is when a student takes their right hand and places it on their left shoulder and squeezes those muscles; while doing so the student follows their hand with their eyes and in transition can exhale making a 'who' sound. This activity is often done several times and then related with the opposite hand and shoulder (Dennison & Dennison, 2010).

Positive points. Lightly place your fingertips from both hands above your eyebrows up toward your hairline and hold. This exercise is beneficial when an individual is feeling stressed as it increases relaxation by alleviating mental stress; often used to increase "organization, study skills, and test performance" (Dennison & Dennison, 2010, p. 71).

Rocker. A student sits on the floor with their knees up, feet flat on the floor, and their hands positioned behind them for support. They lift their feet a few inches off the ground, and move their knees from side to side, and slowly rock back and forth. This is an energizing activity which helps a student reestablish his or her center of gravity, thus increasing relaxation and

promoting better attention and commitment of learned materials to memory (Dennison & Dennison, 2010).

Sipping water. The simple act of sipping water and holding that sip in your mouth for a second is considered the energizing activity for PACE (Dennison & Dennison, 2010).

Space buttons. Place one hand on the center of your back with your fingers pointed down. Then, place to fingertips on your upper lip just under your nose. Imagine breathing energy in and up your spine and out your nose to relive stress. This is an energizing activity that is used with individuals who struggle to relax and/or focus and attend for extended periods of time (Dennison & Dennison, 2010).

Think of an X. Thinking of an X allows a student to cross the right and left visual field to enhance "spatial awareness and visual discrimination (Dennison & Dennison, 2010). One can start by closing their eyes and imagining a line going from their right shoulder down to their left hip, and then imagining a line going from their left shoulder to their right hip.

Thinking cap. A student puts each hand to its corresponding ear, and by gently pinching the ear with the thumb and forefingers, one rolls out the folds of the ears, slowing working their way down toward the lobe and back up. Benefits of this exercise include increased mental acuity, short-term working memory, and improved auditory attention (Dennison & Dennison, 2010).

Chapter II: Literature Review

This chapter will describe research that has been conducted on movement-based learning, the effects of movement-based therapies, and the purpose of Brain Gym in education. It will also provide in-depth information related to the effects that movement-based physical and cognitive exercises have on individuals both inside and outside of the classroom. A comprehensive overview of Brain Gym techniques and their specific targets, such as attention, fine-motor function, and organization, will be provided.

Movement-Based Learning

Students may find it difficult to concentrate in class, focus on a test, learn basic math concepts, or read fluently and comprehend material. A vast array of movement-based learning techniques and exercises purportedly help individuals learn to the best of their abilities (Dennison & Dennison, 2010). Mindfulness is one such learning technique which encourages individuals to pay attention to their own movement as well as the movements of those around them (Andersen & Mannion, 2011). Bishop et al. (2004) described mindfulness as a process that one can apply to regulate attention and focus in order to conjure awareness to current experience. Mindfulness allows an individual to relate to experiences around them. It invokes curiosity which in turn leads to openness and acceptance. Other experts in mindfulness (e.g. Smalley & Winston, 2010) would agree, and claim that mindfulness is a state of consciousness characterized by awareness to one's surroundings while keeping an open and curious mindset to fully attend to the here and now. For example, when mindfulness is applied, an individual is able to approach the present moment with acceptance; as such, mindfulness can then be conceptualized as absolute awareness and attention to the present moment (Kee et al., 2012). According to Smalley and Winston (2010), mindfulness can be achieved through explicit practices such as meditation,

yoga, or t'ai chi, though just as well when working on an art project or while taking a walk.

The study of mindfulness has received increasing attention in various sub-disciplines of psychology (Andersen & Mannion, 2011). However, it should be noted that mindfulness is essentially rooted in the Buddhist tradition and has been practiced for over 2,500 years (Smalley & Winston, 2010). The general practice is known to most in the field as Mindful Awareness Practices, or MAPS (Smalley & Winston, 2010). According to Kee and Liu (2011), mindfulness in the context of human movement has grown in popularity and interest as of late. Although the research is fairly new, it demonstrates that recurring practice can:

> reduce stress, boost the body's immune system, help individuals cope with painful life situations, deal with negative emotions, increase self-awareness, improve attention and concentration, enhance positive emotions, enhance performance- whether in work, sports or academics, and actually positively changing the structure of our brains (Smalley & Winston, 2010, p. 1).

Mindfulness aims to change the relationship one has with life; it cannot change personal experiences but can influence how an individual approaches life in all its joys and challenges (Smalley & Winston, 2010). For example, one research study that initially aimed to understand mindfulness and balance ultimately progressed to studying and aiding understanding of mindfulness in relation to learning (Kee et al., 2012). In this study, 35 male participants were recruited to participate in 30 trials to understand mindfulness behind balance by completing a pre and post balance mindfulness survey after performing a one-legged balancing task. Results of this study reported that when mindfulness is applied to any task, one is able to be more engaged with what is happening in the moment, and full attention and awareness is achieved (Kee et al., 2012). Mindfulness is a movement-based technique that allows individuals to optimize

maximum presence in the moment by increasing awareness through enlightenment of one's own movement as well as the movement of those around them. Therefore, it is possible that including mindfulness within the realm of an educational foundation could prove beneficial.

A research study by Shoval (2011) examined the connection between five separate cooperative learning activities to determine whether or not cooperative or active learning in conjunction with mindful movement improves the ability to study and understand the skills presented in geometry curriculum. A total of 261 second and third grade students participated in this study. Of those students, 158 learners participated in the experimental group and the remaining 103 learners participated in the control group. Children in the experimental groups participated in movement-based small groups that expected them to collaborate, perform experiments, and communicate effectively. For example, students in a movement-based group who were learning about circles formed a circle with their bodies. Then, they moved as a group to understand movement and make the connection between the shape and the action it could take, which was rolling. Results from the study suggested those who participated in mindful movement obtained significantly better results in studying angles than those in the control group (Shoval, 2011).

Other research studies concerning movement-based learning have shown these types of techniques are beneficial in respect to education. A U.S. study looked at individual learning styles of 5,300 students, spanning in age from 10 to 18-years-old (Klein, 2000). The study separated learning into three categories: Haptic/Kinesthetic- learning from moving, touching, and doing; Visual- learning from pictures and images; and Auditory- learning from spoken words or music. Of the three, the majority of the students selected the Haptic/Kinesthetic category. This finding suggests that most students would benefit from movement-based activities to help them

be successful across all settings (Klein, 2000).

Another research project, conducted by occupational therapists Hutton and Stone (2010), aimed to provide teachers with evidence-based activities that would help students develop the necessary motor skills to be engaged in their learning environment. This project was implemented with a total of 45 teachers within five primary schools over a period of 18 months. Not all of the specific techniques utilized in this study were available, but certain interventions such as standing next to one's desk while working and instructing a student to read while on his or her belly on the floor, were available. The results indicated that teachers had increased awareness of the importance of integrated movement on a child's ability to learn (Hutton & Stone, 2010).

Movement-Based Therapy

Movement-based therapy has also been used with students who struggle emotionally, which in turn affects them academically. Movement-based therapies ultimately promote self-control over an individual's ability to attend, focus, and concentrate, as well as increase their awareness of the environment, which in turn has been known to reduce stress (Peck, et al., 2005).

Movement-based therapies like mindfulness and yoga have been recommended to remedy a variety of ailments. For instance, psychotherapies that focus on body movement and body orientation have been proven effective within many populations and environments (Payne & Stott, 2010). Nickel et al. (2006) conducted body movement research that yielded positive results for individuals who suffered from somatization, depression, and anxiety. In another study, the use of yoga proved promising for alleviating depressive symptoms (Shapiro, 2007). Payne and Stott (2010) obtained positive results with body movement therapy, not only in regard to anxiety and depression, but with medical ailments such as irritable bowel syndrome and

fibromyalgia as well. Not only has movement therapy been beneficial in relation to the practice of medicine, it is becoming more of a popular form of therapy used in the academic world, especially when applied to students who display emotional, behavioral, or academic struggles in school.

Movement-based therapy can take many shapes. One form of movement psychotherapy is a BodyMind Approach (BMA), which recognizes that mental health struggles, such as anxiety and depression, can influence physical disease as the two are ultimately intertwined (Payne & Stott, 2010). Another movement-based therapy that adopts a similar body-mind approach is known as Integrated Movement Therapy (IMT), which consists of an approach involving six core principles: structure and continuity; social interaction; language; stimulation; self-calming; physical stimulation and self-esteem building (Kenny, 2002). The goal of IMT is helping the body and mind work together for the benefit of the student. Through a systematic use of yoga, behavioral counseling, and speech language pathology, IMT aims to engage students who struggle with a variety of educational disabilities such as Attention-Deficit/ Hyperactivity Disorder (ADHD), developmental delay, Autism Spectrum Disorder (ASD), and sensory integration difficulties (Kenny, 2002).

In a study conducted by Ager et al. (2011), movement therapy, along with other forms of therapy such as music, art, and drama, were used in a series of psychosocial structured activities (PSSA) to help students in Uganda who had been severely affected by civil unrest. The participants included 203 students from eight different schools in northern Uganda who received the PSSA intervention, which consisted of a series of 15 class sessions aimed to increase an individual's resilience through structured activities including movement, music, art, and/or drama. Additionally, there was a control group of 200 students who were waiting to receive the

intervention. When compared to the control group, those who received the intervention reported significant increases in personal well-being (Ager et al., 2011).

Yoga is another common exercise regimen that has been very popular as well as beneficial for individuals who use it on a consistent basis. “To yoke” is the definition of yoga; it represents the connection between mind, body and spirit, and the foundation for this practice goes back to 200 A.D. (Siri & Lyons, 2012, p. 482). Ultimately, yoga is a movement-based therapy that helps individuals focus on their body and breathing to self-soothe and promote attention and focus in their environment (Peck et al., 2005). According to Siri and Lyons (2012), yoga is a form of therapy designed to help individuals develop effective and lifelong mind body techniques that will empower and allow them to live life to the fullest. The specific poses along with an emphasis on awareness of breath outline what is needed to enhance personal development with the goal of harmonizing mind, body, and spirit (Siri & Lyons, 2012). Yoga has been implemented to help students with a variety of difficulties in the classroom (Peck et al., 2005).

Multiple studies indicate yoga is an effective technique to promote balance and focus. According to Peck, et al. (2005), yoga is a promising alternative to help students who display social, emotional, behavioral, and academic difficulties. Other studies report that specific aspects of yoga, such as the demands of physical posture, controlled breathing, concentration, and focus on relaxation positively affect one’s mental state (Peck et al., 2005). The results of one study suggest yoga increases students’ feelings of well-being and body awareness (Hopkins & Hopkins, 1976). Another study found yoga was an effective intervention for elementary students who struggle with attention in school (Peck et al., 2005). The study utilized elementary students with known attention problems who participated in thirty-minute yoga sessions, twice a week for

a total of three weeks. The results of pre and post measures indicated their ability to attend significantly improved (Peck et al., 2005). These students also reported enjoyment from participating in the yoga exercises. It is possible that an entire classroom of students could benefit from practicing yoga.

Brain Gym®

In the 1970's, Dr. Paul and Gail Dennison started to research and contribute to the field of educational kinesiology. Educational Kinesiology is the study of how specific movements of the body stimulate neurological connections that increase learning ability (Cammisa, 1994). Dr. Paul Dennison was particularly interested in what is now known as Dennison Laterality Repatterning, which "achieves the neurological integration between the vestibular system, the gross-motor movements of the cerebellum, and the basal ganglia, as well as equal activation of the left and right hemispheres" of the brain (Basic Brain Gym Concepts, 1997, p.1). In other words, he chose to study the connection between the body and mind, to integrate bodily movements to enhance learning by strengthening the connection between both sides of the brain. This particular area of study aims to discover how individuals can learn through movement. When the body moves in certain ways or in specific patterns, which allow both sides to move together, messages are sent to the brain, thus allowing an individual to assimilate and discriminate new information. Therefore, by controlling specific bodily movements, educational kinesiology purports to trigger and stimulate specific responses in the brain, ultimately helping individuals control both hemispheres in the brain, which makes learning easier (Cammisa, 1994).

Dr. Paul Dennison developed the educational training program known as Brain Gym®, trademarked in 1987 by the Educational Kinesiology Foundation (Dennison & Dennison, 2010). Brain Gym is marketed in more than 80 countries ("What is 'Brain Gym,'" 2013). Brain Gym is

a program that uses specific body movements to enhance behavioral and academic readiness, as well as learning potential. Brain Gym is a collection of 26 movement activities that allow an individual to understand his or her place in space; it allows one to connect the mind and body in order to function as a single unit, thus allowing the highest capacity of learning across a multitude of environments to take place. Brain Gym activities enable students to feel they are in control of how they learn by understanding what kind of learner they are (Klein, 2000).

For the past 40 years, Brain Gym has been used in the classroom, mainly overseas, as a means to engage students and improve classroom performance (Dennison & Dennison, 2010). Brain Gym incorporates movement in order to activate the mind and engage the body to work together to achieve maximum learning. Brain Gym promotes this type of learning through attainment of five areas of experience (Dennison & Dennison, 2010). The first area includes sensory-motor mechanics, also known as the physical skills needed to develop academic and cognitive skills. The second area is self-regulation, which consists of development of self-care skills and includes learning to take initiative and other independent skills such as self-direction. The third area is structured play, which promotes play-based interactions with peers across multiple environments and in different scenarios. The fourth area is symbolic thinking, developing mental processing abilities that are used for decoding and visual imagery. Finally, the fifth area is developing aesthetic appreciation by engaging individuals through experiential activities that value nature, art, and various forms of movement. These experiences will increase problem-solving skills and enable greater learning, which will help increase student educational achievement (Dennison & Dennison, 2010).

According to Hyatt (2007), many claim that Brain Gym provides the necessary amount of stimulation needed for effective learning. Effective learning allows individuals to build

confidence in their abilities, ultimately increasing self-esteem as well as initiative and desire for learning (Klein, 2000). According to Dennison and Dennison (2010), movement opens the door to learning and is important for people of various ages and physical and emotional states. Movement is an essential element in learning, one that is necessary in order to be fully alert and able to process information that is being presented. Brain Gym movements are intended to build and improve upon sensory skills over time based on ability level and individual needs (Dennison & Dennison, 2010). Randel McChesney, an expert in the field of educational kinesiology from the Richards Institute of Education and Research, believes that physical skills play a vital role in one's ability to strengthen cognitive ability and gain emotional stability needs (as cited in Dennison & Dennison, 2010).

Brain Gym movement exercises fully engage brain function to provide opportunities for students to develop skills, thus allowing them to be successful learners (Klein, 2000). A key element of Brain Gym is building strength in our bodies and minds as well as learning to listen to what our body and mind tells us it needs in order to be successful. Brain Gym exercises offer support, do not require equipment or a classroom aide, and only take minutes to implement. Brain Gym exercises teach learners how to relax and let go of stress by becoming more aware of the environment around them. This mentality is very similar to that of the practice of mindfulness, which has been shown to be very helpful in teaching powerful self-help strategies that individuals can rely on in difficult times (Shoval, 2011). For example, when Brain Gym techniques are properly applied, these exercises can help individuals with difficulties and disabilities such as poor memory, poor organizational skills, poor body coordination, fine-motor difficulties, poor concentration, Dyslexia, Attention Deficit Hyperactivity Disorder (ADHD), and other observed difficulties (Sridharan, 2013). According to Dennison and Dennison (2010), true

learning is more than just understanding one's own mental processes and memorizing information. The human brain uses the body's senses to learn through physical and mental experiences (Dennison & Dennison, 2010).

Brain Gym taps three primary functions which are essential to primary movement: equilibrium, locomotion, and sensorimotor coordination (Dennison & Dennison, 2010). Equilibrium refers to a state of physical, intellectual or emotional balance. Locomotion is the act of moving from place to place. Finally, sensorimotor coordination is the functioning between both sensory and motor aspects of the body (Merriam Webster Online, 2013), which contributes to "physical skills of learning, the perceptual, behavioral, and postural correlates of academics" (Dennison & Dennison, 2010, p. 2). When combined, these three functions propel one's academic abilities. According to Dennison and Dennison (2010), movement and play based learning techniques help individuals of any age access innate intelligence, which presents the lifelong adventure of learning in a monumental way.

Using one's senses allows an individual to make inferences about his or her surroundings and commit information to memory. Sensory data is the first to be processed by children, which ultimately is the precursor for memory (Dennison & Dennison, 2010). The meaning behind sensory data as well as how much attention was paid to it are fundamental to memory. Therefore, memories that are movement and sensory based tend to be more meaningful and ultimately, more likely to be stored and recalled at will. Brain Gym is described as a process for re-educating the mind and body that would result in learning a skill more easily and efficiently (Hyatt, 2007). Not only can Brain Gym activities promote stronger memory storage and retrieval, they benefit an individual's organization, focus, and communication skills (Dennison & Dennison, 2010).

Dennison and Dennison (2010), report that parents and educators are coming to understand that teaching academic skills also provides lifelong visual, auditory, and motor habits. Without proper understanding of one's environment as well as the skills necessary to be successful, an individual will struggle. Many children who start school and are not prepared and struggle to adjust to the demands and skills needed to be successful (Dennison & Dennison, 2010). One way to achieve success is by helping the body and mind work together. When a student or individual struggles with a challenge of any kind, physical or mental, many Brain Gym activities claim to help individuals develop such skills. Brain Gym activities are meant to be fun and easy to do. These activities can also be adapted to each individual who uses them. For instance, if someone recently had surgery or is in a wheelchair, every move can be modified to be just as effective for that person.

Brain Gym can be used to promote a positive learning environment in the classroom. During a TEDtalk, positive psychology expert Shawn Achor (2011) stated that reality does not shape us, but it is "the lens through which the brain views the world that shapes reality; if we can change the lens, then we can change the perception of happiness." Using Brain Gym in the classroom is similar to changing the lens through which one views education. Most students enjoy moving around. Through movement activities students use their senses to experience learning in a positive manner. Yet, as with most movement-based programs, there is a specific protocol that is recommended.

Before any student engages in Brain Gym, each student is encouraged to find their "PACE: Positive, Active, Clear, and Energetic" (Dennison & Dennison, 2010, p. 26). PACE enables an individual to relax, notice their environment, engage with it, and then prepare for successful learning. Starting backward from Energetic, a student goes through a simple set of

motions to bring them to positive, which represents a relaxed and engaged learner. First, students start by sipping water; then, they do the Brain Buttons exercise; followed by the Cross Crawl activity; ending with part one and two of Hook-Ups.

Then, the 26 activities are divided up into categories, as each move has a specific purpose. For example, Energy Exercises and Deepening Attitudes are two Brain Gym categories that help students understand and develop organizational skills by participating in specific up-and-down movements. According to Dennison and Dennison (2010), up-and-down movements are meant to physically and emotionally center and align an individual; therefore, such movements create a calm and relaxing feeling, which allows students to organize and plan thoughts and/ or activities successfully. Organization, also related to stabilization in Brain Gym, refers to finding balance (Dennison & Dennison, 2010).The human body benefits from alignment, it is what helps humans understand gravity, the body's upper and lower portions, as well as the central axis which aids midline movement and direction (Dennison & Dennison, 2010). Energy exercises and deepening attitudes activities focus on alignment and stabilization, which are important components for learners to be aware of because they can help individuals identify emotions, manage impulses, and stabilize oneself when stressed or irritated.

There are a total of seven energy exercises and three deepening attitudes activities that are specifically designed to develop "organization, stability, and sensory memory" (Dennison & Dennison, 2010, p. 7). By participating in any of these activities students develop balance with walking, bending, twisting, and build self-awareness skills to help them know where they are in relation to the space around them, which helps regulate emotions and physical behaviors. Sipping Water, The Energy Yawn, The Thinking Cap, Space Buttons, Earth Buttons, Brain Buttons, and Balance Buttons are the seven energy exercises that were developed by Dennison

and Dennison (2010), which aim to help learners build "tactile and kinesthetic awareness," which enhances sensory skills and spatial orientation by developing physical balance and emotional preparedness to stress (p.52). Energy exercises are meant to ground and stabilize an individual so he or she can respond appropriately to actions going on around them. The Positive Points and parts one and two of Hook-Ups are the three deepening attitudes activities used to decrease "stress, tension, or prolonged inactivity" (Dennison & Dennison, 2010, p. 52). Deepening attitudes activities further relax a student and motivate the use of self-calming techniques. Ultimately, a student can use individual Brain Gym movements or a combination of activities to process information and minimize emotional stress that can be linked to that environment.

Another category of exercises are known as the Lengthening Activities. These specific movements help students develop the ability to focus through participating in forward-and backward movements, which are thought to release tension and encourage a learner to take initiative through sustained attention and self-expression (Dennison & Dennison, 2010). Activities developed to promote focus and participation in the classroom start by strengthening students locomotion through running, skipping, hopping, jumping, and pushing off, which enhances the ability to "anticipate, comprehend, and sustain attention" (Dennison & Dennison, 2010, p. 6). Lengthening activities also build on learners' ability to relax, relieve tension, and become more flexible, in order to be able to attend, focus, participate, and engage in complex thought in the classroom. The Owl, Arm Activation, The Footflex, The Gravity Glider, The Calf Pump, and The Grounder are the six lengthening activities Dennison and Dennison developed to promote focus and participation in a student's educational environment. These activities use slow purposeful stretching movements in combination with focused breathing to lengthen muscles and

advance mindfulness. Ultimately, the goal of these exercises is to restore to body by reaching, lengthening, and opening an individual, which over time leads to physical, mental, and emotional preparedness and readiness to take in information being presented.

Finally, there is a group of activities referred to as Midline Movements. Dennison and Dennison developed midline movements to help learners develop sensorimotor coordination and information processing abilities needed for educational activities such as "reading, writing, listening and speaking" (Dennison & Dennison, 2010, p. 6). Midline movements aid development of processing as well as communication skills. Visual-motor skills such as holding a pencil, forming letters and numbers, cutting with scissors, and throwing a ball are all centered on midline movements. In this case, visual- motor activities encourage the right and left visual fields of the brain to work together to cross the vertical midline, which can aid academic achievement by enhancing "motor dexterity, visual coordination, and active listening" (Dennison & Dennison, 2010, p. 9). Midline activities are able to increase active listening as such visual-motor skills are essential to information processing as well as communication between both hemispheres of the brain.

The more of the brain that is actively engaged in the learning process, the better, because it promotes long term storage and retrieval of information learned. There are eleven midline movements in all: Think of an X, Neck Rolls, The Double Doodle, Alphabet 8's, Belly Breathing, The Cross Crawl, The Energizer, The Rocker, Lazy 8's, Cross Crawl Sit-ups, and The Elephant. These midline movements support coordination of both sides of the body through hearing, sight, and touch. In the 1970's, Dr. Paul Dennison worked with optometrists who taught him that bilateral and contralateral movements help learners develop perceptual-motor skills. Essentially, midline movements enable visual learning by facilitating "bi-hemispheric

integration," or in layman's terms, helping learners cross the midline to access learning from both sides of the brain (Dennison & Dennison, 2010, p. 29).

While Brain Gym is designed to activate cognitive functioning, communication, comprehension, focus, and organization (Basic Brain Gym Concepts, 1997), and many teachers believe it is effective, there has been criticism of the program. Specifically, there are concerns regarding empirical support for Brain Gym. There was some research conducted in the 1970s and 1980s that identified benefits of Brain Gym (Howard-Jones, 2008). Additionally, there is research supporting the principles Brain Gym is built on. For instance, research has shown that physical activity is associated with blood flow and activation to the front parietal, or area of the brain that controls motor function, which plays a key role in high order functioning as well as mathematical reasoning (Howard-Jones, 2008). Furthermore, even short periods of exercise have been proven to improve short and long-term learning which subsequently enhances learning (Howard-Jones, 2008). However, there is minimal research that has investigated the effects of Brain Gym activities within the classroom environment. Therefore, additional data concerning the use of Brain Gym in the classroom is needed in order to draw a firm conclusion about its utility.

Chapter III: Methodology

The present study was a pilot study, a preliminary study that is conducted to assess the feasibility of the design. This design was used to gather information and determine how students feel about participating in Brain Gym in the classroom. This chapter will address the methodology of the study. Areas addressed will include information about the participants, instruments that were used, data collection procedures, and data analysis procedures. Additionally, this chapter will include a discussion of the limitations of the study design.

Participants

The participants included in this study consisted of 20 students from an elementary school in rural Wisconsin. The school housed 413 students total, ranging from first to fifth grade. Of those students, 90.6% were identified as White not Hispanic, 24.0% were identified as Economically Disadvantaged, and 4.1% were identified as Limited English Proficient (Wisconsin Department of Public Instruction [DPI], 2014). According to the school report card, this school received an accountability score and rating of 78.5, which exceeds expectations in the state of Wisconsin (DPI, 2014). All of the participants were from the same classroom. The participants were third and fourth grade students, ranging in age from 8-years-old to 10-years-old, with a mean age of 9-years-old. There were 10 third grade students included in the study, four girls and six boys. There were also 11 fourth grade students included in the study, five girls and six boys.

Instrumentation

An electronic pretest and posttest Brain Gym research survey was created using the *Qualtrics* software program in Fall 2013. The survey had a total of 16 items; 14 of the items utilized a Likert-type scale. Items asked students about social, emotional, behavioral, and

academic functioning and if they felt Brain Gym helped them to be successful learners. A pretest and posttest snapshot survey was also administered before and after each Brain Gym session. The snapshot survey was created using *Google Forms* in fall 2013. The snapshot survey contained only one question about what emotions each student was feeling at the time the survey was administered. Eighteen feeling words were provided for students to choose from when responding to the question. A blank space was also provided to allow students to fill in words that described how they were feeling that were not on the list.

Data Collection Procedures

An elementary school in one specific school district in Wisconsin was targeted for this research. In that elementary school, many classroom teachers were already implementing Brain Gym activities on a regular basis. However, each teacher's implementation process varied based on schedule, time, and commitment. Therefore, this study utilized the classroom of a teacher who had not yet implemented Brain Gym activities.

A consent form was mailed to the legal guardian(s) for each of the students. Only students with a signed consent form were included in the study. The Brain Gym survey was administered five times to participants. It should be noted that for the initial pretest, the first survey administration, consent was obtained for only 15 students. Those 15 students received an electronic link to the Brain Gym research survey in September 2013 prior to Brain Gym being established as part of the classroom routine. Later, consent was obtained for five additional students who were included in the remainder of the survey results. When completing the survey, participants signed onto a school computer and answered the survey items individually. The classroom teacher provided a designated time for the survey in order to ensure students would have enough time to complete each item. This researcher was available to answer any questions

students may have had during the time of administration.

Participants were administered the snapshot survey in the classroom. Each participant received a paper copy of the survey once a week for 12 weeks. One side of the survey requested information regarding current physical and emotional state before participating in Brain Gym, and the opposite side contained the same question to be filled out after participating in Brain Gym. Participants completed the snapshot survey at their desks.

Data Analysis

Data from this study was analyzed in relation to six research questions. The first five research questions all involved analyzing responses on the Brain Gym survey. The first research question pertained to whether or not students enjoy participating in Brain Gym activities. The second research question examined if students' believe Brain Gym is effective. The third question addressed if students use Brain Gym exercises in and outside of school. The fourth research question examined which techniques do students use and/or prefer. The fifth research question investigated how often students use Brain Gym techniques. In order to answer these research questions, responses on the first Brain Gym survey administration were qualitatively compared to responses on the last Brain Gym survey administration. Prior to this comparison, the percentage of participants who selected a specific response was calculated for each of the survey items. Since each item had four possible responses, the percentage of participants who selected a response was calculated for each of the four responses for each survey item. This involved taking the number of participants who selected a certain response and dividing it by the total number of participants who completed the item. The process was repeated for every response for every item on the survey.

The sixth and final research question examined whether or not Brain Gym has a positive

effect on emotional state. This involved analyzing the responses on the snapshot survey, which only had one question. The snapshot survey was administered twelve times. Each time, the participants completed the survey both before and after participating in Brain Gym activities. The responses on the survey were analyzed for each administration, which involved comparing the before responses to the after responses. Prior to this comparison, the responses had to be transformed. Although the snapshot only had one questions, there were 18 response options as well as a blank space for participants to write in a response. Thus, in order to analyze them, the responses were grouped into two different categories: desired and undesired. Desired behaviors included positive emotions such as: happy, calm, focused, content, and ready. Undesired behaviors included but were not limited to: sad, nervous, mad, frustrated, bored, tense, and confused.

Chapter IV: Results

This study investigated student perceptions of Brain Gym. Multiple research questions were examined. The first question was to determine whether or not students enjoy participating in Brain Gym activities. The second question was whether or not students feel they are more prepared academically, behaviorally, and emotionally after participating in Brain Gym in the classroom. The third question was whether or not students use Brain Gym in and out of the educational setting. The fourth question was to determine what exercises they prefer. The fifth question was how often they use Brain Gym techniques. The sixth question was whether or not Brain Gym exercises have a positive effect on emotional state.

Research Question One

In order to determine if students enjoyed participating in Brain Gym activities, responses from the first administration of the Brain Gym survey (n = 15) were compared to the responses on the last administration (n = 20). This comparison involved responses on item 1 of the survey, which asked how the respondent felt about Brain Gym. The majority of the pretest responses (73%) indicated they liked or loved doing Brain Gym in the classroom. Seven percent of the pretest responses indicated they did not like doing Brain Gym. On the posttest, the percentage of students who indicated they liked or loved doing Brain Gym decreased to 55%. The percentage of posttest responses that indicated the students did not like doing Brain Gym increased to 20%. The percent of participants that reported the enjoyment of Brain Gym is illustrated in Table 1.

Table 1

Student Enjoyment of Brain Gym

Response	*Pretest n = 15*	*Posttest n = 20*	*Difference Between Pretest and Posttest*
Do not like Brain Gym	7%	20%	13% increase
Brain Gym is Okay	20%	25%	5% increase
Sort of like Brain Gym	20%	25%	5% increase
Love doing Brain Gym	53%	30%	23% decrease

Research Question Two

Examining the beliefs about Brain Gym being effective involved comparing the responses on items 4, 5, 6, and 7 from the first (n = 15) and last (n = 20) Brain Gym survey administrations. Student responses to items 4, 5, 6, and 7 on the pretest and posttest are listed in Appendix D. Item 4 asked participants if they felt relaxed after doing Brain Gym. On the pretest, 13% of the students indicated they never feel relaxed after doing Brain Gym exercises while 40% indicated they always feel relaxed after doing Brain Gym. Responses to the posttest survey, indicated that the percentage of students who never feel relaxed after doing Brain Gym slightly decreased to 11% and the percentage of students who always feel relaxed after doing Brain Gym also slightly decreased (32%).

Item 5 asked if it is easier to concentrate after doing Brain Gym. On the pretest, 27% of student respondents reported they always feel it is easier to concentrate after participating in Brain Gym and 40% reported they feel that most of the time it is easier to concentrate. Thirteen percent of the students reported they rarely or never feel it is easier to concentrate after participating in Brain Gym. Responses on the posttest, indicated that the percentage of students who always feel it easier to concentrate after Brain Gym slightly decreased to 25%, and the percentage who feel it is easier most of the time also decreased (20%). The percentage of

students who rarely or never feel it is easier to concentrate after doing Brain Gym increased to 20%.

Item 6 on the Brain Gym survey asked students if they felt participating in Brain Gym helped them get better grades. On the pretest, 53% of the students indicated most of the time, if not always, they feel Brain Gym helps them get better grades while 27% indicated Brain Gym rarely or never helps their grades. Responses on the posttest, indicated the percentage of students who most of the time or always feel Brain Gym helps them get better grades slightly decreased to 45%. The responses also indicated the percentage of students who feel Brain Gym rarely or never helps slightly increased to 30%.

Item 7 asked respondents if using Brain Gym techniques they have learned helped them have a better attitude toward school and learning. On the pretest, 87% of the students agreed that using Brain Gym techniques helped them have a better attitude toward school and learning, whereas 13% percent disagreed. Posttest responses indicated the percentage that agreed decreased by 52%. The posttest responses also indicated the percentage of students who disagreed that using Brain Gym techniques helped them have a better attitude toward school and learning increased by 27%.

Research Question Three

In order to determine if students utilize Brain Gym exercises, responses from the first administration (n = 15) of the Brain Gym survey were compared to the responses on the last administration (n = 20). This comparison involved responses on survey items 8, 9, and 10. Student responses on these items are available in Appendix D. Item 8 asked students if they use Brain Gym techniques to help them concentrate during class. Responses on the pretest indicated that 20% of students always use Brain Gym to help them concentrate during class. Responses on

the pretest also indicated 20% of students never use Brain Gym during to help them concentrate. Posttest responses, indicated the percentage of students who always used Brain Gym to help them concentrate in class slightly decreased to 15% and the percentage of students who never use Brain Gym to help them concentrate slightly increased to 25%.

Item 9 on the survey asked if respondents use Brain Gym to help them concentrate during a test. On the pretest survey, 7% of students responded that they always do and 29% report that most of the time they do. Fourteen percent of pretest respondents indicated they never use Brain Gym to help them concentrate during a test. Responses on the posttest indicated 20% of students always use Brain Gym to help them concentrate during a test, 10% of students use it most of the time, 25% said sometimes, and 30% never use it.

Item 10 asked if participants used Brain Gym when nervous or anxious. Responses on the pretest indicated 20% use it always or most of the time. Responses on the pretest also indicated 26% of students rarely or never use Brain Gym when nervous or anxious. On the posttest, 25% of students indicated they use Brain Gym always or most of the time when nervous or anxious. Thirty-five percent of students indicated on the posttest that they rarely or never use it.

Research Question Four

Examining which Brain Gym techniques students use and/or prefer involved comparing responses on the Brain Gym survey item 11 from the initial (n = 15) and last administration (n = 20). Item 11 asked students which Brain Gym techniques they use regularly. The percent of participants that reported preference for the Brain Gym exercises is illustrated in Table 2.

Table 2

Student Preferences of Specific Brain Gym Exercises

Brain Gym Exercise	Pretest n = 15	Posttest n = 20
Cross Crawl	73%	85%
Brain Buttons	73%	75%
Hook-ups	67%	90%
Sip Water	27%	35%
Belly Breathing	20%	30%
Energy Yawn	20%	20%
Neck Rolls	13%	10%
Double Doodle	7%	5%
Lazy 8s	7%	20%
Energizer	7%	0%
Thinking Cap	7%	30%
Positive Points	7%	10%
Footflex	7%	10%
Cross Crawl sit-ups	7%	10%
Calf Pump	0%	35%

On the pretest survey, the most popular Brain Gym exercises were Cross Crawl (73%), Brain Buttons (73%), and Hook-ups (67%). Responses on the posttest indicated the percentage of students who preferred Cross Crawl increased 12%, the percentage of students who preferred Brain Buttons increased 2%, the percentage of students who preferred Hook-ups and Thinking Cap increased by 23%, and interest in the Calf Pump increased 35%. Responses on the posttest

indicated the percentage of students who preferred Sipping Water increased by 8%, Lazy 8s increased by 13%, Positive Points, Footflex, and Cross Crawl sit-ups all increased by 3%. The percentage of students who initially preferred Neck Rolls, Double Doodle, and Energizer, decreased according to posttest survey results.

Research Question Five

Investigating how often student use Brain Gym techniques involved comparing responses to items 2 and 14 on the first (n = 15) and last administration (n = 20) of the Brain Gym survey. Student responses to these items are available in Appendix D. Item 2 asked how often students use Brain Gym in the classroom every day. Responses on the pretest indicated that all of the students used Brain Gym at least once a day and 20% of the students used Brain Gym two to three times a day. Responses on the posttest indicated 95% of students used Brain Gym at least once a day and 26% used it two times or more per day.

Item 14 on the survey asked respondents how often they use Brain Gym outside of school. On the pretest, 27% of students indicated they never do and 47% of students indicated they used it at least once a week. Responses on the posttest, indicated the percentage of students who never use Brain Gym outside of school increased by 18%. Additionally, posttest responses indicated the percentage of students who use it at least once per week decreased by 27%.

Research Question Six

To determine the effect Brain Gym has on an individual's emotional state, responses were collected in a pretest/ posttest snapshot survey, which was distributed before and after participation in Brain Gym activities in the classroom. The survey asked students to select words that described how they felt. Responses were divided into two categories: desired, which represent positive emotions, and undesired, which represent negative emotions. Table 3

demonstrates the total accumulation of desired versus undesired emotions identified before and after student participation in Brain Gym from twelve weeks of data collected.

Table 3

Before and After Snapshot Survey Results: Total Words Identified

Response	Before	After	Difference
Desired	31%	69%	38% increase
Undesired	81%	19%	62% decrease

The snapshot survey results indicated that 31% of students selected at least one word associated with positive emotions before engaging in Brain Gym activities in the classroom, and 81% of students selected at least one word associated with negative emotions. Data collected after participation in Brain Gym indicated the percentage of students who selected at least one word associated with positive emotions increased by 38%; the percentage who selected at least one word associated with negative emotions decreased by 62%.

Chapter V: Discussion

This pilot study sought to further the research on movement-based learning. Specifically, it focused on a program named Brain Gym. Brain Gym creators Paul and Gail Dennison (2010) firmly agree that the implementation of Brain Gym leads to optimal living and learning. Hyatt (2007) stated that Brain Gym exercises can be used to encourage learning in an assortment of academic areas which can be used to improve critical and abstract thinking, memory, and self-esteem. Another area which could be improved is engagement. Movement activates the mind, which encourages the mind and the body to work together to achieve maximum learning (Wolfsont, 2002). While some experts believe Brain Gym does have a positive impact on learning and there is research supporting the principles on which the program is built, few studies have investigated the utility of Brain Gym within the classroom setting (Hyatt, 2007). This study examined the utility of Brain Gym exercises within an elementary classroom. Specifically, it investigated the students' perceptions of Brain Gym, including whether or not students liked doing Brain Gym exercises and if they felt the exercises were helpful.

Research Question One

This investigation had several questions it sought to answer. The first question examined if students enjoyed participating in Brain Gym activities. Answering this question involved comparing responses on item 1 from the pretest and posttest Brain Gym survey. The comparison indicated there were differences in the students' feelings towards Brain Gym activities between the pretest and the posttest. After regular participation in Brain Gym, students had less positive feelings toward the program. Indeed, results from the pretest, N=15, indicated approximately half of the students had strong, positive feelings towards Brain Gym. However, results on the posttest, N=20, indicated only one third of the students had strong, positive feelings towards

Brain Gym. This finding suggests that initially students may have been excited about the prospect of participating in Brain Gym, but as time progressed, some students lost that initial enthusiasm. More systematic research in this area would elucidate why students' initial feelings toward the program changed over time.

Research Question Two

The second research question investigated whether or not students felt more academically, behaviorally, and emotionally prepared to learn after participating in Brain Gym. This particular research question aimed to gain a clearer understanding of student perceptions of the effectiveness of Brain Gym in regard to their education. Answering this research question also involved comparing student responses on the pretest and posttest Brain Gym survey. The academic component of the question was measured by item 6 on the survey. This item asked students if they felt Brain Gym helps them get better grades. A comparison of the pretest and posttest responses indicated that students' opinions stayed relatively the same. On the pretest, N=15, students had mixed opinions regarding Brain Gym's effect on their grades. Students responses on the posttest, N=20, also indicated mixed opinions. Although some students reported Brain Gym helps them get better grades, the percentage of students who felt that way slightly decreased after participating in the program. This suggests that participation in Brain Gym activities may be beneficial to some, but in general, it does not have a strong impact on grades.

Examining whether or not students felt emotionally prepared to learn after participating in the Brain Gym program involved survey items 4 and 7. Item 4 inquired about relaxation. A comparison of student responses on this item indicated students' perceptions regarding relaxation stayed relatively the same after 12 weeks of participation in the program. At the end of those 12 weeks, the majority of students reported feeling relaxed after participation in Brain Gym at least

some of the time. This suggests that participation in Brain Gym sometimes led to students feeling relaxed within the classroom. Item 7 on the Brain Gym survey examined students' attitudes. A comparison of responses on item 7 from the pretest and the posttest indicated students' opinions regarding Brain Gym helping them have a better attitude toward learning decreased after regular participation in the program. Indeed, the percentage of students who agreed that using Brain Gym helped them have a better attitude toward school and learning decreased by 52% between the pretest and the posttest. This suggests that for most students, participation in Brain Gym exercises does not have a positive impact on their attitude toward school and learning.

The investigation of Brain Gym's behavioral impact involved comparing student responses to item 5 from the pretest and posttest Brain Gym survey. This item concerned concentration. The comparison of responses on item 5 indicated students felt the impact of Brain Gym exercises on their concentration was not as strong. After 12 weeks of regular participation in the program, the percentage of students who reported they always feel it is easier or feel that most of the time it is easier to concentrate after participating in Brain Gym decreased from 67% to 45%. Although the percentage of students who reported Brain Gym exercises had a strong impact on their concentration decreased after regular participation, only one-fifth of students rarely or never felt it was easier to concentrate after doing Brain Gym. Thus, the majority of students believed participating in Brain Gym activities had a positive impact on their concentration.

Relaxation and concentration are two critical aspects to consider when determining whether or not Brain Gym is effective and beneficial. Indeed, when students feel relaxed and are able to concentrate, they are much more likely to be academically engaged (Payne & Stott, 2010). Furthermore, when students are able to be academically engaged, they tend to perform to

the best of their ability (Garn & Jolly, 2014). In terms of relaxation and concentration, the results indicated the majority of students felt Brain Gym exercises had a positive impact on their concentration and they felt relaxed after participation some of the time. This would suggest Brain Gym does have a positive impact on students' emotional and behavioral preparedness in the classroom. However, most students felt that participation in Brain Gym exercises did not have a positive impact on their attitude toward school and learning. Additionally, when asked if Brain Gym helps them get better grades, students had mixed opinions, which did not change after participating in the program for 12 weeks. Thus, overall, Brain Gym can have a positive influence on academic, behavioral, and emotional preparedness in the classroom, but the impact appears to be limited. Additional research is needed in order to understand the magnitude of the influence Brain Gym plays on students' academic, behavioral, and emotional preparedness.

Research Question Three

The third research question examined if students utilize Brain Gym exercises in the classroom. Specifically, this question examined if students use Brain Gym techniques to help them concentrate during class, when they feel anxious, and/or to help them concentrate on a test. Answering this question involved comparing pretest and posttest responses to items 8, 9, and 10 on the Brain Gym survey. Item 10 asked if participants use Brain Gym techniques when nervous or anxious. Between the pretest and the posttest, students' responses stayed relatively the same. This suggests that participation in Brain Gym did not impact whether or not students use the techniques when they feel nervous. Additionally, the results indicated that only approximately one-fourth of students always or most of the time use Brain Gym techniques when they do feel nervous.

Item 8 asked students if they use Brain Gym techniques to help them concentrate during class. On the pretest, how frequently students utilized the techniques for concentrating in class varied. However, the majority indicated they do use the techniques for that purpose at least some of the time. When these results were compared to the responses on the posttest, the frequency of use slightly decreased. This suggests that regular participation in the Brain Gym program had little effect on how often students use the techniques to help them concentrate in class. Item 9 on the survey asked if respondents use Brain Gym to help them concentrate during a test. A comparison of responses on the pretest and posttest indicated that students used the techniques less often after participating Brain Gym for 12 weeks. However, responses on the posttest also indicated the majority of the students use the techniques at least some of the time to help them concentrate on the test.

Overall, the results suggest that students sometimes use Brain Gym techniques in the classroom. However, the findings also suggest that regular participation in the program for 12 weeks did not increase students' use of the techniques. In fact, in some cases, the frequency decreased. Thus, whether or not a student utilizes Brain Gym techniques in the classroom appears to come down to individual preference. Additional research in this area should focus on possible differences between students who frequently use Brain Gym techniques and those who never or rarely use them.

Research Question Four

The fourth research question investigated which Brain Gym techniques students use regularly. This examination involved comparing responses to item 11 on the pretest and posttest Brain Gym survey. On the pretest, multiple activities were selected as being used regularly by students. The three activities with the highest percentage of student use were Cross Crawl, Brain

Buttons, and Hook-ups. The percentage of students who regularly used these three exercises increased between the pretest and the posttest. Additionally, the comparison of the pretest and posttest indicated more students were using Brain Gym exercises regularly. These findings suggest that regular participation in the program increases students use of Brain Gym exercises overall. However, additional research is needed to clarify when and why students use the techniques.

Research Question Five

The fifth research question examined how often students use Brain Gym techniques both within the school environment and outside of school. A comparison of student responses to item 2 on the pretest and posttest Brain Gym survey provided information about how often students utilize the techniques in the classroom. The results indicated that the vast majority of students used Brain Gym techniques in the classroom at least once per day both before and after 12 weeks of participation in the program. Interestingly, the frequency of use stayed relatively the same between the pretest and posttest. These findings suggest that most students use Brain Gym techniques at some point while in the classroom, but that the frequency of use did not seem to be impacted by regular, prolonged participation in the program.

Investigating how frequently students use the techniques outside of school involved comparing responses to item 14 on the pretest and posttest Brain Gym survey. The comparison indicated the frequency of use decreased after participating in the program for 12 weeks. On the pretest, N=15, approximately 75% of students indicated they used Brain Gym techniques outside of school at least once a month. However, on the posttest, N=20, only 40% of students indicated they used Brain Gym techniques outside of school at least once a month. Furthermore, only 20% of students indicated on the posttest that they use the techniques outside of school at least once a

week. These findings suggest that only some students use Brain Gym techniques frequently outside of school, and that after regular participation in the program the frequency decreased. Overall, the results indicated that students use Brain Gym techniques more frequently in the classroom than outside of school. However, regular participation in the program did not have a positive effect on the frequency of use in either setting.

Research Question Six

The sixth, and final, research question examined whether or not participation in Brain Gym activities had a positive effect on students' emotional state. This investigation involved analyzing responses on the snapshot survey, which was administered weekly for the duration of the 12 week program. Students were asked to identify feelings before participating in a Brain Gym session and again immediately following the completion of the session. Responses were coded into two categories: desired and undesired. The snapshot data collected during the first week indicates an increase in desired or positive emotions such as calm, ready, and focused, and a decrease in undesired or negative emotions such as nervous, tense, and bored following participation the Brain Gym session. This trend continued throughout the 12 weeks of the program. According to data collected for all twelve weeks, the amount of positive emotions reported doubled after participating in Brain Gym. Additionally, negative emotions decreased drastically after participating in Brain Gym. These results suggest that Brain Gym promotes positive emotions within the educational environment, which according to Reschly, Huebner, Appleton, and Antaramian (2008), are positively associated with academic engagement. Thus, incorporating Brain Gym activities in the classroom may lead to higher student engagement. However, additional research is needed in order to provide strong evidence of this link.

Overall, examining the research questions provided interesting results. When looking at

the utility of Brain Gym within the educational environment, three areas were investigated: academic, emotional, and behavioral preparedness. In terms of behavioral preparedness for learning, the impact of the program on students' concentration was examined. The results concerning concentration were inconsistent. Although the majority of students indicated the program had a positive effect on their ability to concentrate and they use Brain Gym techniques to help them concentrate during class at least some of the time, the reported frequency for using the techniques to help concentrate during a test decreased after participating in the program for 12 weeks. Thus, while the frequency of utilizing the techniques to aid with concentration varied, students believed Brain Gym had a positive impact on concentration.

Results concerning the impact of Brain Gym on emotional preparedness for learning were also inconsistent. In terms of relaxation, the majority of students reported feeling relaxed after participation in Brain Gym at least some of the time. Furthermore, participation in the program led to a significant increase in positive emotions and a decrease in negative emotions, suggesting that Brain Gym promotes positive emotions within the educational environment. However, students' responses concerning the effect of the program on their attitude toward learning and school indicated the exercises did not have a positive impact on their attitude. Furthermore, only approximately one-fourth of students reported they frequently use Brain Gym techniques when they feel nervous.

Academic preparedness was measured in terms of grades. When asked if Brain Gym helps them get better grades, students had mixed opinions. Some felt the program was beneficial while others did not. Overall, the results suggest that Brain Gym can have a positive influence on academic, behavioral, and emotional preparedness in the classroom. However, the positive influence seems to be limited to specific aspects of these areas. Additionally, it appears that some

students benefit more from participation in the program than others. This may be due to student buy-in. For instance, initially, the majority of students seemed to be excited about participating in the program, but as time went on, those feelings waned for some while other continued to be excited. Furthermore, students' opinions regarding specific uses for Brain Gym techniques as well as the program's impact on their preparedness for learning stayed relatively the same between the onset and conclusion of the 12 weeks of participation. Thus, individual student preference and/or buy-in may play a significant role in whether or not Brain Gym exercises are beneficial.

Limitations and Future Directions

It is difficult to draw firm conclusions based on the results of this study due to some limitations. First, there were sampling limitations. Due to the recruitment methodology, the participants were not randomly selected. All of the students who participated in this pilot study were from the same, combined grade classroom. This may have a confounding effect since the 4th grade students had prior experience with Brain Gym from the previous school year while the 3rd grade students had no prior experience. Additionally, since only one classroom was targeted, the total number of participants was relatively small. Overall, the sample is limited in generalizability.

Another limitation of the sample is the number of students who participated in the pretest was not the same as the number that participated in the posttest. This imbalance in combination with the small sample size may have contributed to changes seen between the pretest and the posttest, making it difficult to draw firm conclusions regarding the impact of the program on those changes. Future researchers should work to get a large sample that is representative of the population and controls for previous experience with the Brain Gym program. Although getting

such a sample would likely be difficult, it would help the results be more definitive and generalizable.

Another limitation of this study was the instrumentation utilized. Due to a lack of a structured, reliable measure, the researcher developed a survey for this study. Thus, the instrument used has not been well researched and lacks psychometric data. Validation studies are needed in order to demonstrate the survey is a valid and reliable measure. Additionally, the current instrument lends itself to qualitative analysis as opposed to quantitative, which limits its utility. In the future, it may be beneficial to address this issue by redesigning the measure to have all multiple-choice items and the same Likert-type responses for those items. This would potentially result in stronger, objective conclusions about the Brain Gym program. Furthermore, additional items may need to be added in order measure areas the current survey does not address, such as during which type of classroom related activities do students use Brain Gym techniques as well as why students use the techniques.

Another limitation is that students did not participate in Brain Gym for a regulated amount of time. Brain Gym exercises were implemented in a standardized fashion. Thus, if time did not permit, then not all of the exercises were used within a given session. As a result, some Brain Gym activities were frequently implemented with the students and others were implemented less often not random or varied in any way. The amount of exposure to certain Brain Gym activities may have impacted student use of the techniques, and therefore, may have skewed the results regarding frequency and technique preference. Further research should take a standardized, structured approach to the implementation of Brain Gym, including controlling for the time of day the exercises are implemented as well as the frequency of implementation for each exercise.

Despite the limitations, this study did provide some answers regarding the utility of Brain Gym within the educational environment. This study found that most students enjoy participating in Brain Gym and believed the exercises are beneficial. Particularly, the findings suggested that the program had a positive impact on emotional well-being. This includes increasing positive emotions, while also decreasing negative emotions, and contributing to feeling relaxed. These effects were reported to occur within the educational environment. While the impact of Brain Gym on grades was mixed, the benefit of promoting positive emotions within the classroom could potentially lead to improvement in academic performance. It has been shown that the more an individual displays positive emotions during school the more likely the student is to obtain higher levels of engagement (Reschly et al., 2008). Given that engagement is a critical component of learning, implementing Brain Gym activities could potentially lead to improved learning outcomes for students. However, more evidence is needed. Therefore, future research should focus on measuring the impact of Brain Gym on student engagement as well as specific learning outcomes.

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Appendix A: IRB Approved Permission Form

University of Wisconsin-Stout
Menomonie, Wisconsin 54751-0790
Pilot Study Concerning Student Perceptions of Brain Gym in the Classroom
Lodi Elementary School

This research study is being conducted by Andrea Sommerfeldt, an Education Specialist candidate in the School Psychology program at the University of Wisconsin- Stout. This pilot study concerns student perspectives of Brain Gym as a form of positive psychology used in the classroom. Brain Gym is a program used by some teachers, like Mrs. Kratcha, to teach students movement exercises that will help him or her focus, attend, and learn in the classroom. Students will perform at least one Brain Gym exercise in the morning, and will be encouraged to use that exercise throughout the day. All consenting students will be asked to complete a short questionnaire regarding their perceptions of Brain Gym in the classroom once a month for the first three months of school.

The results of this study will contribute to our knowledge about the effects of Brain Gym and how it relates to individual student perceptions of academic and behavioral performance in school. All questionnaire responses will be held confidential. A research paper will be written about the results of the study, but it will not contain any identifying information.

Your participation in this research study is completely voluntary; you may stop participating at any time prior to the completion of this research project without any penalty. This study has been reviewed and approved by UW-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by law and University policy.

I will be pleased to answer any questions you may have now, or you may call me at any time with questions about the research. You may also contact my research advisor Dr. Amy Zimmerman, Assistant Professor In the School of Education, or Sue Foxwell, Director of Research Services.

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Advisor: Amy Zimmerman, Ph. D.
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IRB Administrator
Sue Foxwell, Director, Research Services
715-232-2477
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I have read and understand the above information and agree to give my consent to participate in the study entitled, "A Pilot Study Concerning Student Perceptions of Brain Gym in the Classroom." By checking yes on this consent form you agree to participate in the project studying student perceptions on the effects of Brain Gym in the classroom. _____ Yes ____ No

_____
Student signature Date

_____
Signature of parent or guardian Date

Appendix B: Pretest and Posttest Brain Gym Survey

Brain Gym Pretest and Posttest Survey

"This research has been approved by the UW-Stout IRB as required by the Federal regulations Title 45 Part 26."

1) How do you feel about using Brain Gym in the classroom?
- I do not participate in Brain Gym in the classroom
- I do not like doing Brain Gym
- Brain Gym is Okay
- I sort of like Brain Gym
- I love doing Brain Gym in the classroom

2) How often do you use Brain Gym in your classroom everyday?
- Never
- Less than once a day
- Once a day
- 2-3 times a day
- More than 3 times a day

3) Would you recommend other students use Brain Gym?
- Definitely will not
- Probably will not
- Probably will
- Definitely will

4) Do you feel relaxed after doing Brain Gym?
- Never, Rarely, Sometimes, Most of the time, Always

5) Do you feel it is easier to concentrate after doing Brain Gym?
- Never, Rarely, Sometimes, Most of the time, Always

6) Do you feel Brain Gym helps you get better grades?
- Never, Rarely, Sometimes, Most of the time, Always

7) Do you feel that by using Brain Gym techniques you have learned, you have a better attitude toward school and learning?

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly Agree

8) Do you use Brain Gym techniques to help you concentrate during class?

- Never, Rarely, Sometimes, Most of the time, Always

9) Do you use Brain Gym techniques to help you concentrate during a test?
   - Never, Rarely, Sometimes, Most of the time, Always

10) Do you use Brain Gym when you are nervous or anxious?
   - Never, Rarely, Sometimes, Most of the time, Always

11) What Brain Gym techniques do you never use, sometimes use, use often, and use regularly?

Lazy 8's	The Cross Crawl	The Double Doodle	Alphabet 8's	The Elephant
Neck Rolls	The Rocker	Cross Crawl Sit-ups	Belly Breathing	The Energizer
Think of an X	The Grounder	The Gravity Glider	Earth Buttons	Balance Buttons
Space Buttons	The Energy Yawn	The Thinking Cap	Hook-Ups	The Footflex
The Owl	Arm Activation	The Positive Points	Brain Buttons	The Calf Pump

12) Do you have a favorite Brain Gym technique? If so, which one?
   - _____

13) Do you use Brain Gym outside of school?
   - Yes
   - No

14) How often do you use Brain Gym outside of school?
   - Never
   - Less than once a month
   - Once a month
   - 2-3 times a month
   - Once a week
   - 2-3 times a week
   - Daily

15) Have you ever taught a family member or friend a Brain Gym technique outside of school?
   - Never
   - Once
   - Occasionally
   - Often

16) Would you recommend Brain Gym to someone outside of school?
   - Definitely yes
   - Probably yes
   - Probably not
   - Definitely not

Appendix C: Pretest and Posttest Snapshot Survey

Snapshot Survey

"This research has been approved by the UW-Stout IRB as required by the Federal regulations Title 45 Part 26."

The following questions are designed to gain a better understanding of how students feel before and after they participate in Brain Gym activities in the classroom.

Week___

1. Check all of the words that describe how you feel below BEFORE participating in this Brain Gym activity. Please select all that apply.

Happy
Sad
Nervous
Excited
Calm
Anxious
Mad
Ready
Frustrated
Focused
Distracted
Content
Tense
Bored
Upset
Stuck
Confused
Unhappy
Other:_____

2. Check all of the words that describe how you feel below AFTER participating in this Brain Gym activity. Please select all that apply.

Happy
Sad
Nervous
Excited
Calm
Anxious
Mad
Ready
Frustrated
Focused
Distracted
Content
Tense
Bored
Upset
Stuck
Confused
Unhappy
Other:_____

Appendix D: Research Question Tables

Survey Question 1. How do you feel about using Brain Gym in the classroom?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Percentage
I do not participate in Brain Gym in the classroom	0	0	0	0
I do not like doing Brain Gym	1	7	4	20
Brain Gym is okay	3	20	5	25
I sort of like doing Brain Gym	3	20	5	25
I love doing Brain Gym in the classroom	8	53	6	30

Survey Question 2. How often do you use Brain Gym in your classroom everyday?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Percentage
Never	0	0	0	0
Less than once a day	0	0	1	5
Once a day	12	80	13	68
2-3 times a day	3	20	4	21
More than 3 times a day	0	0	1	5

Survey Question 3. Would you recommend other students use Brain Gym?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Percentage
Definitely will not	0	0	1	5
Probably will not	2	13	5	25
Probably will	9	60	9	45
Definitely will	4	27	5	25

Survey Question 4. Do you feel relaxed after doing Brain Gym?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Percentage
Never	2	13	2	11
Rarely	0	0	1	5
Sometimes	3	20	4	21
Most of the time	4	27	6	32
Always	6	40	6	32

Survey Question 5. Do you feel it is easier to concentrate after doing Brain Gym?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Percentage
Never	1	7	3	15
Rarely	1	7	1	5
Sometimes	3	20	7	35
Most of the time	6	40	4	20
Always	4	27	5	25

Survey Question 6. Do you feel Brain Gym helps you get better grades?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Never	1	7	4	20
Rarely	3	20	2	10
Sometimes	3	20	5	25
Most of the time	5	33	4	20
Always	3	20	5	25

Survey Question 7. Do you feel that by using Brain Gym techniques you have learned, you have a better attitude toward school and learning?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Strongly Disagree	0	0	4	20
Disagree	2	13	4	20
Neither Agree nor disagree	0	0	5	25
Agree	9	60	5	25
Strongly Agree	4	27	2	10

Survey Question 8. Do you use Brain Gym Techniques to help you concentrate during class?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Never	3	20	5	25
Rarely	2	13	4	20
Sometimes	6	40	7	35
Most of the time	1	7	1	5
Always	3	20	3	15

Survey Question 9. Do you use Brain Gym techniques to help you concentrate during a test?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Never	2	14	6	30
Rarely	2	14	3	15
Sometimes	5	36	4	25
Most of the time	4	29	2	10
Always	1	7	4	20

Survey Question 10. Do you use Brain Gym when you are nervous or anxious?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Never	2	13	6	30
Rarely	2	13	1	5
Sometimes	8	53	8	40
Most of the time	2	13	1	5
Always	1	7	4	20

Survey Question 12. Do you have a favorite Brain Gym technique?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Cross Crawl	3	38	2	12
Hook-ups	1	12	2	12
Brain Buttons	1	12	2	12
Energy Yawn	1	12	1	6
Calf Pump	1	12	1	6
Neck Rolls	1	12	1	6
Double Doodle	0	0	1	6
Sipping Water	0	0	1	6
The Rocker	0	0	1	6

Survey Question 13. Do you use Brain Gym outside of school?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Yes	8	57	8	40
No	6	43	12	60

Survey Question 14. How often do you use Brain Gym outside of school?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Never	4	27	9	45
Less than once a month	0	0	3	15
Once a month	1	7	3	15
2-3 times a month	3	20	1	5
Once a week	3	20	2	10
2-3 times a week	3	20	1	5
Daily	1	7	1	5

Survey Question 15. Have you ever taught a family member or friend a Brain Gym technique outside of school?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Never	8	53	10	50
Once	4	27	5	25
Occasionally	2	13	3	15
Often	1	7	2	10

Survey Question 16. Would you recommend Brain Gym to someone outside of school?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Frequency
Definitely yes	4	27	4	21
Probably yes	7	47	7	37
Probably not	3	20	5	26
Definitely not	1	7	3	16

Research Question 1. Do students enjoy participating in Brain Gym activities?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Percentage
Do not like Brain Gym	1	7	4	20
Brain Gym is Okay	3	20	5	25
Sort of like Brain Gym	3	20	5	25
Love doing Brain Gym	8	53	6	30

Research Question 2. Do students think Brain Gym is effective?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Percentage
Never	4	7	13	16
Rarely	6	10	8	10
Sometimes	9	15	21	27
Most of the Time	24	40	19	25
Always	17	28	17	22

Research Question 3. Do students use Brain Gym exercises?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Percentage
Never	7	16	17	28
Rarely	6	14	8	13
Sometimes	19	42	20	33
Most of the time	7	17	4	7
Always	5	11	11	19

Research Question 4. Which techniques do they use regularly/ prefer?

Student Responses	Pretest n= 15		Posttest n= 20		Difference
	Frequency	Percentage	Frequency	Percentage	Percentage
Cross Crawl	11	73	17	85	12%
Brain Buttons	11	73	15	75	2%
Hook-ups	10	67	18	90	23%

Research Question 5. How often do they use Brain Gym?

Student Responses	Pretest n= 15		Posttest n= 20	
	Frequency	Percentage	Frequency	Percentage
Never	4	13	9	23
Once a month or more	4	13	7	19
Once a week or more	6	21	3	8
Daily	13	43	14	37
2-3 times a day or more	3	10	5	13

Research Question 6. Does Brain Gym have a positive effect on emotional state?

Snapshot Survey	Before		After	
Student Responses	Frequency	Percentage	Frequency	Percentage
Positive Emotions	227	30.96	506	69
Negative Emotions	291	81.05	68	18.94